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Future Buying of Railroad Rolling Stock

Purchases for 1922, Though Fairly Large, Have Not Come Up to Estimated Requirements of the Carriers

ALTHOUGH the steel companies, locomotive and car builders, and to a certain extent the manufacturers of machinery, have this year felt the stimulus of railroad buying of freight cars and locomotives, together with the large volume of repair work that has been done, the total of such railroad buying has not come up to the expectations of those who have studied railroad rolling stock requirements in the light of statistics covering the past 20 years. This leads to their conclusion that if the railroads are to restore their rolling stock to its normal condition, buying of cars and locomotives will continue throughout the next year or two, at least, on a fairly large scale.

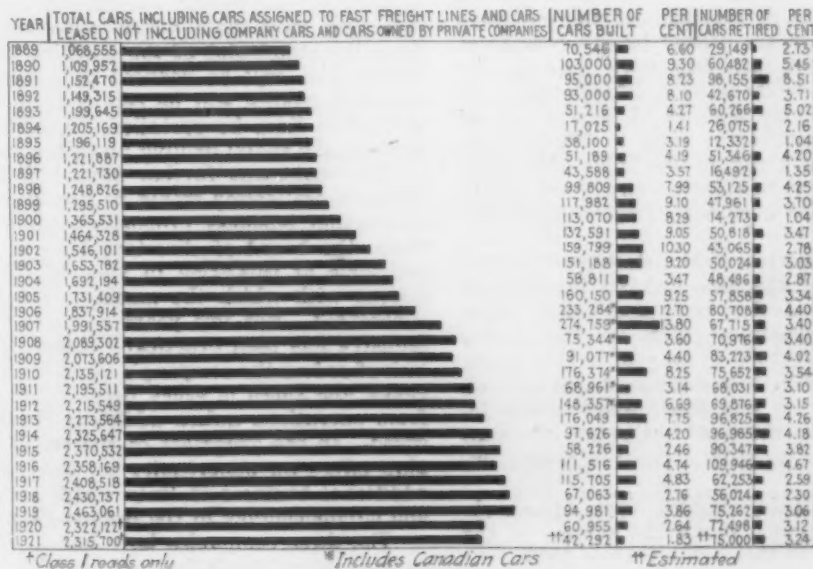
Figures compiled from official sources show that up to Oct. 1 there had been ordered this year a total of 125,000 freight cars and *Railway Age* estimates the number of locomotives ordered up to Oct. 21 at 1848.

While 1922 will rank as a fairly good year in railroad buying of rolling stock it does not compare with some of the good years before the war. In 1916, for example, there were 170,054 cars and 2910 locomotives ordered; in 1912, another good year, railroads ordered 234,758 cars and 4515 locomotives. Going back still further there were even higher records in 1905 and 1906, the two banner years of two decades in railroad buying. In 1905 the railroads of

the country ordered 341,315 cars and 6265 locomotives; in 1906 they ordered 310,315 cars and 5642 locomotives.

Thus it will be seen that in years when the railroads were not handling nearly so heavy a traffic movement as now exists there was considerably larger buying of rolling stock. In 1905 the railroads carried 186,463,109,510 ton miles of freight with a total of 1,731,409 cars, while in 1920, a heavy traffic year, they moved 413,698,749,000 ton miles with 2,322,122 cars (this total applying to Class I roads only). The average carrying capacity has increased, however, during that period several tons per car.

An analysis of car and locomotive purchases for a ten-year pre-war period, from 1902 to 1911, inclusive, shows an average annual purchase of 177,025 cars and 3704 locomotives. The subsequent decade, which includes the war years, during which there was comparatively little railroad buying, shows an average per year of 106,469 cars and 2151 locomotives bought. It will thus be seen at a glance



*Class I roads only

*Includes Canadian Cars

**Estimated

The Chart Immediately Above Shows the Number of Freight Cars in Use in the United States Each Year from 1889

The Chart Immediately Below Shows the Freight Cars Delivered Annually, 1911 to 1921

YEAR	DOMESTIC	FOREIGN	TOTAL
1911	58,902	5,908	64,810
1912	116,950	13,254	130,204
1913	172,729	14,452	187,181
1914	91,852	3,401	95,253
1915	46,704	13,707	60,411
1916	100,863	17,147	118,016
1917	99,500	24,038	123,538
1918	52,701	42,833	95,534
1919	82,845	60,164	143,009
1920	46,784	14,602	61,386
1921	38,259	5,351	44,610

that in the ten years ended Dec. 31, 1921, the railroads had not replenished their rolling stock at more than 60 per cent of the average buying in the preceding ten-year period.

Theoretically, the railroads of the United States are supposed to be actually short several

hundred thousand cars of what past experience has proved presumably to be their requirements. Whether more efficient handling of traffic and the gradual increasing in car capacity will permit the railroads to operate efficiently during years of large freight movement with a fewer number of cars than statistics indicate to be necessary is still to be fully determined, but the present traffic situation points clearly to a shortage of cars. The carrying capacity of cars has been increased somewhat and the pulling power of locomotives is now considerably larger.

Those who have based their estimates of probable railroad buying of rolling stock during the next few years on statistics kept for the past 20 years or more argue that 200,000 cars a year should be built to keep railroad rolling stock in normal condition, taking care of cars retired and providing for normal growth in the volume of traffic to be moved. On account of the present actual shortage of cars, it is further argued that the railroads should buy fully 250,000 cars during the next year to place themselves in good condition.

As each car requires an average of about 10 tons of steel (the range being from about 6 tons for box cars to 17 tons for heavy steel cars) railroad purchasing of 250,000 cars during 1923 would mean a demand for approximately 2,500,000 tons of steel. Locomotive purchases over a period of 20 years have averaged close to 3000 per year, requiring a total, roughly, of 250,000 tons of steel. These figures on possible steel requirements do not include the large number of car and locomotive accessories, which involve considerable foundry and machine-shop work, but which do not run into exceptionally large tonnages.

The actual condition of railroad rolling stock at the present time becomes more readily understood when the 1921 figures on purchases are taken into consideration. In that year only 239 locomotives and 23,346 cars were ordered, which brings down the average for 1921 and 1922 to such a low figure as to give a ready explanation of the present so-called "car shortage."

Figures on freight car purchases for 1922 are not complete, however, without reference to the contracts let for car repairs. Orders booked by car companies up to Oct. 15, this not including work done in the railroad companies' own shops, total 93,000 cars. As each car repaired probably requires at least 5 tons of steel, this activity accounts for close to 500,000 tons additional steel orders going to the mills this year. In all of 1921 the car companies repaired only 48,782 cars, which shows quite a gain for repair work this year.

Another factor of interest to the steel trade is that a larger percentage of the cars ordered in the past few years has been all-steel or part steel construction, while the average capacity of each car has grown steadily, from 28 tons in 1902 to over 45 in late years. As the movement of such heavy commodities as coal, coke, ore, pig iron, scrap and steel products has increased very heavily in the past ten years, the need for cars of larger capacity built of steel is readily explained.

The accompanying table, compiled from figures obtained from official sources, shows the volume of car and locomotive buying in this country since 1900.

Car and Locomotive Purchases		
Year	Locomotives, Number	Cars, Number
1901.....	4,340	193,439
1902.....	4,665	195,248
1903.....	3,283	108,936
1904.....	2,538	136,561
1905.....	6,265	341,315
1906.....	5,642	310,315
1907.....	3,482	151,711
1908.....	1,182	62,669
1909.....	3,350	189,360
1910.....	3,787	141,024
1911.....	2,850	133,117
1912.....	4,515	234,758
1913.....	3,467	146,732
1914.....	1,265	80,264
1915.....	1,612	109,792
1916.....	2,910	170,054
1917.....	2,704	79,367
1918.....	2,593	114,113
1919.....	214	22,062
1920.....	1,998	84,207
1921.....	239	23,346

No estimate of probable purchases of railroad roll-

ing stock within the next few years can properly be reached without due consideration of the figures showing the growth of traffic. Even in 1921, which was a year of general industrial depression, the railroads carried 309,443,050,000 ton miles of freight, only slightly over 100,000,000,000 ton-miles short of that carried in 1920, which was the heaviest traffic year on record, exceeding even the war years of 1917 and 1918. The figures showing the increase in traffic since 1900 follow:

Year	Ton-Mileage	Ton-Miles Per Car Per Day
1900.....	141,596,551,161	284
1905.....	186,463,109,510	295
1910.....	255,016,910,451	327
1915.....	276,830,302,723	320
1916.....	365,771,824,741	424
1917.....	394,465,400,493	449
1918.....	405,379,284,206	457
1919.....	364,293,063,017	405
1920.....	413,698,749,000	487
1921.....	309,443,050,000	366

Reed-Prentice Co.'s Plans for Becker and Whitcomb-Blaisdell Companies

The stockholders of the Reed-Prentice Co., Worcester, Mass., have ratified the recommendation of the board of directors to purchase the business of the Becker Milling Machine Co., Hyde Park, Mass., and the Whitcomb-Blaisdell Machine Tool Co., Worcester, including good will, trade names, patents, etc., and certain machinery and equipment, raw materials and the entire inventories of finished machinery and cutters, and such portions of semi-manufactured products as the new owners consider worth moving. The Becker and Whitcomb-Blaisdell plants will be sold and the business concentrated in the Reed-Prentice plants in Worcester.

In a statement by the Reed-Prentice Co. it is brought out that "in combining the business in a few plants it is proposed to simplify the lines in an important way, retaining only those which seem the most desirable from the standpoint of the machine tool market. The Becker line will be reduced to some extent, but the standard models will be retained, of course. So, too, will other lines be curtailed, including engine lathes, upright and radial drilling machines and planers."

The statement further says: "While the contemplated consolidation would be considered a fundamentally sound business proposition under normal conditions, the board of directors believes it is especially advisable at this time in view of the abnormal conditions with which the machine tool industry is now confronted. For two years or more the machine tool industry has been practically stagnant. Owing to the lack of orders the company's losses have been extremely heavy and there is every prospect of continued losses from operations unless additional business can be secured. In the judgment of the board of directors the plan offers an opportunity to the company to secure additional business in lines which are consistent with and supplementary to the company's present lines."

The three companies have had a joint operation of various departments for two years or more, announcement being made in THE IRON AGE of July 8, 1920, that their sales, purchasing, accounting and executive departments had been combined and that various selling agencies throughout the country had been displaced by direct factory branches.

American marine engines recovered from wooden hulls originally built for service against Germany are now to be shipped to Germany and installed in steel hulls built there, according to a statement from a salvage company in Portland, Ore., which is "scrapping" the wooden ships. There are 162 triple-expansion engines, of 1400 hp. each, involved in the proposed deal which would provide the rapidly growing German fleet of freight ships with motive power at less cost and in less time than would be needed to build new engines.

Optimism Prevails at Institute Meeting

Members Look Forward to Period of Prosperity, but Do Not Ignore Unfavorable Factors—Large Attendance and Notable Addresses

OUTSTANDING features of the twenty-second general meeting of the American Iron and Steel Institute, held at the Hotel Commodore, New York, last Friday, were the opening address of the president, Judge Gary, who expressed the hope that another conference would be held at Washington for a discussion of the financial, commercial and industrial questions and advocated greater publicity in the affairs of business companies and labor unions; the presentation of papers of great excellence; the dinner speech of Rear Admiral Carl T. Vogelgesang, who made a vigorous argument for a strong Navy; the address of Dwight W. Morrow, New York attorney, and the delightful informal remarks of Charles M. Schwab, in which he poked fun at Judge Gary as a farmer and told why he wanted to live 20 years longer. An amplifier installed in the banquet hall enabled all of the banqueters to hear the speeches distinctly.

The attendance of 1350, while 200 short of the record made in November, 1921, when Marshal Foch was the guest of honor, was considered excellent for a time when there was no extraordinary attraction.

The drift of sentiment as expressed in the lobbies was optimistic, although it is of course recognized there are still some disturbing features of present conditions. Further recessions are expected in pig iron prices and possibly in finished materials.

At the meeting of the directors of the Institute, Willis F. McCook, president Pittsburgh Steel Co., was elected a director to fill the vacancy caused by the resignation of George F. Downs, formerly president Lackawanna Steel Co.

The 12-Hour Day

In his preliminary remarks before beginning his formal address at the opening morning session, Judge Gary said that the committee appointed to investigate the 12-hr. day was not ready to report. "I very much regret that this is true," he said. "I wish to urge all interested to furnish the special committee and sub-committees at the earliest possible moment any information that would be of value on this important subject. Many have neglected to do so. We have been urged to act in regard to this matter by the President of the United States, who has been fair and reasonable, and in fairness to him, who is carrying such heavy burdens, we ought to help in every way in our power."

Papers Presented

An exceedingly varied range of subjects was covered by the nine papers on the technical program. The principal activities of the industry from coal to electric furnaces were discussed, only the blast furnace having no place on the program this year. Abstracts of some of the papers follow, and those not included here will be published in later issues of THE IRON AGE.

Absent Members Honored

In opening the post-prandial program in the evening, Judge Gary spoke with much feeling of Joseph G. Butler, Jr., of Youngstown, and Willis L. King of Pittsburgh, vice-president Jones & Laughlin Steel Co.

"I am extremely sorry," said Judge Gary, "that Uncle Joe is not with us to-night. He is still ill, but in fine spirits, and we trust that he will live for many years. Another good friend, Willis King, has been in poor health for several months, but is improving rapidly. We earnestly hope that both of these men will be restored to health, and, as a slight tribute to them, I ask that you all rise and stand for a moment." This request was complied with.

The Navy and the Steel Industry

After referring briefly to the fact that Friday was the birthday of Theodore Roosevelt, and therefore Navy Day, Judge Gary introduced Rear Admiral Carl T. Vogelgesang, commandant of the Brooklyn Navy Yard. He spoke of the Navy as the foster parent of the steel business and the backbone of industry and the life of the nation. He said that the recent conference for limitation of armament at Washington had the effect of weakening that backbone to some extent and had proved a stimulus for fanatical pacifists, who are a positive danger to the country. He said that so long as there is a desire to make progress implanted in the heart of man there will be competition, and that in seeking the goal of ambition a national sacrifice is sometimes necessary, for war is the ultimate expression of economic strife. The nation must be productive and progressive. In order to be progressive, it must export about 20 per cent of its products which it cannot use itself. For this reason this country is on the threshold of economic strife. The Navy is the bulwark of defense and is necessary unless we are to sink into decay. To have a cheap Navy is to cause unjustifiable waste. If we are to have any Navy, it must be the best. The Navy has been maintained by about 8 per cent of the Federal budget. This expenditure is not only a provision for insurance, but has done more for science and commerce than any other branch of the Government.

Building the New Navy

The admiral told how in 1882 the building of the new Navy was started when Congress voted to construct four cruisers from domestic steel and of how manufacturers protested that the steel could not be made in this country. Wrought iron was used almost entirely, while the little steel used came from England. These manufacturers hesitated to invest in the large plants necessary, but the steel plants were built, steel men learned how to make good steel, and in a short time the price of steel plates was reduced from 8½c. to 4½c. per lb. Then steel began to supplant all other materials. Andrew Carnegie gave credit to the Navy for being an influence in improving steel manufacture.

The speaker told of researches that had been made for which the Navy had paid, whereby the deleterious effect of sulphur in steel was shown. He spoke of how the Navy had contributed to progress in the electric field—in propelling ships by electricity, in developing radio plants and in other important fields. He also spoke of the contributions of the Navy in personnel service and of the splendid work that is done in machine shops of naval ves-

sels. He referred to the protection given by the Navy to trade and to American citizens in foreign lands. In closing, he made a strong plea for a big Navy of 100 per cent efficiency and declared that the small appropriations made by recent sessions of Congress had interfered with efficient operation. He vigorously denounced "political opportunists and misguided pacifists," who in his opinion are interfering with the progress of the nation.

Mr. Morrow on Modern Progress

Dwight W. Morrow, an attorney of the firm of J. P. Morgan & Co., New York, held the closest attention of the audience as he discussed developments in the progress of the world. He said he was not certain that in future years, when we get a better perspective on the advance of the past 20 years, the World War, great as it was, will overshadow what he considered to be one of the greatest achievements in all history—quantity production. With clear vision and an impressive array of facts and figures, he described how this quantity production affects the lives of the people. Taking sugar as an example, he told how 200 years ago only 1500 tons were used in England in a year, while in the United States last year 4,500,000 tons were consumed. This he said was only one example of how

quantity production has contributed to the comfort and enjoyment of millions of people. He spoke also of the tremendous fluctuations in business in the early days and of the frightful loss of life due to famine and disease, which in recent years has been checked to a large extent. He looked forward to the time when the capitalist-laborer would be the owner of industry. He said that one of the greatest things Judge Gary had accomplished was to increase the number of employees who were also stockholders.

Charles M. Schwab was the last speaker of the evening, and, as usual, delighted the audience. He said that since he last attended a meeting of the Institute he had passed his sixtieth birthday and had now been in the business longer than any other member—43 years. He said that the most highly valued dividends were not those that came in money, but in the friendship of members of the Institute, and for those friendships he would not exchange all that came to him in the way of material success. He wanted to live 20 years more to continue to enjoy those friendships and all the good things of life. He said that he had never built a plant which had been big enough to meet the requirements of the time of prosperity.

President Gary Makes Plea for Publicity

Says Business and Labor Unions Should Be Treated Alike—Places Blame for Interference with Prosperous Conditions

IN opening his address, Judge Gary said that his remarks would relate to economics and would be spoken from the standpoint of the public interest. He said that in consideration of all economic questions, every one should endeavor to determine the final effect upon the people as a whole. Personal or private gain or advancement or political advantage must be subordinated to the general public good. He expressed the opinion that labor, constituting 85 per cent of the cost of production, is not as a rule paid more than is proper, owing to the high cost of living. He deprecated the tendency to believe that everything objectionable can be overcome by the adoption, amendment or repeal of laws. He said that a combination calculated to control business or production either as to quantities or prices, by the employers or by the employees, interferes with the natural course of business and results in hardships upon all who are outside of the combination, who may be termed the consumers.

Referring to demands made upon the Chief Executive of the country, Judge Gary said that "the patience, perseverance, wisdom, ability and honesty of a President like the one now administering the affairs of this country" are required. "We should strive to hold up his hands; we should pray for him and not find fault or condemn," said Judge Gary. "He is doing better, much better, than any one who unjustly criticizes him would do if in his place."

A strong plea was made for publicity, saying its practical results and its necessities in all departments of economic life without discrimination or exception have not been given due consideration. The full exposure to the people of business methods and management on the part of public and private institutions and organizations will, he said, create and firmly establish a powerful, effective and satisfactory public sentiment, which, on the average and for the long run, will be more potential than penal statutes. Judge Gary expressed the opinion that investigations by legislative committees sometimes have been of great benefit and have resulted in correcting existing evils, but more frequently they are harmful because unfair, politically partisan and managed without regard to rules which

govern legal procedure. He added: "The committees are often made up largely of lawyers, some of whom are inclined to deal in personalities, are vindictive and arbitrary, and as the witness or other person subject to investigation is not usually permitted to have a lawyer to represent and protect him, great injustice is likely to result."

Referring to the recent industrial conflict, Judge Gary commended the national administration and added: "There is nothing to be said at this time against labor organizations or their leaders; certainly there is or should be no personal animosity. But to permit any group, and this representing only a minority in its branch of industry, to be exempted from publicity is an injustice and a wrong to the general public."

Judge Gary talked emphatically in regard to the great debt owing by certain foreign nations to the United States, saying that to cancel these debts or any part of them would be forced charity, which is never agreeable to the donor, and, as a rule, equally disagreeable to a self-respecting person or nation. He expressed the hope that there will soon be held in Washington another peace conference for the full and frank discussion of all unsettled financial, commercial and industrial questions in which our people are interested, directly or indirectly, to be participated in by able, open-minded, well-disposed representatives from the different nations, such as those who appeared at the recent limitation of armament conference.

Business Conditions

In conclusion Judge Gary spoke of business conditions, saying:

"There are no obstacles to continued prosperity in the iron and steel business of the United States except such as may arise from interference with the natural course of supply and demand. There is a great abundance of high quality iron ore; steam, gas and coking coal; limestone and other raw products, all within easy reach; also furnaces, mills and shops of the highest grades, railroads and ships for transportation, every variety of experts of pronounced ability, organizations and systems equal to any in the world; and the demand

for every kind and character of steel is far in excess of capacity to produce. Steel is needed immediately for buildings and other structures, for railroads, for farms, for pipe lines, for canning, for equipment of every kind, for guns, tools and implements of thousands of varieties, for wire, ranging from the finest watch springs and piano springs to the largest cables, for cars, automobiles, aeroplanes and other vehicles for transportation of property and persons, and many other purposes.

"Order books are well filled, finished steel, aggregating many thousand tons, is stored at the producing mills, ready for shipment, and this notwithstanding the recent labor troubles at the mines and in transportation circles. Unfortunately there has been an interference with the mining and delivery of coal and with the transportation of finished iron and steel, and there is an insufficient supply of labor.

Who Are Blamable?

"If the natural course of business had not been interrupted, we would now be enjoying success and prosperity in our industry greater than ever before, so far as volume is concerned. Who is blamable? The answer is: Any one who by word or deed has interrupted or hindered the operation of the natural law of supply and demand; or has interfered with the full, free and unlimited right to work, to operate and to produce.

"All that is necessary to prosperity in the United States is the legitimate utilization of our stupendous resources. We can produce here everything to supply to our inhabitants their necessities and their comforts; also luxuries and even delicacies. We can produce without limit, fuel, food, clothing and shelter; everything to make us comfortable and happy, and then have left much for other countries whenever they are in need. We would sell for cash or work or on credit; or when distress is occasioned by calamity, furnish supplies without consideration except a continuance of friendly and Christian response. We are no better than the people of other nations; and we are no worse.

"The fault for lack of continual prosperity in a measure may be laid at our own doors. If so, then let us to the best of our ability overcome our faults and consistently adopt and practice reasonable and constructive policies.

Too Many Tinkers

"Fault in many places no doubt exists. There are too many tinkers, too few experts. Many individuals, by reason of political position or other limited success, assume to know a good deal about matters, particularly economic, concerning which they have little information, derived either from study or experience, and these generally talk the loudest and longest on these subjects. Others from a desire to control or create antagonisms or to derive personal profit, attempt to interfere with the natural and reasonable course of business, sometimes resorting to force and brutality. We must keep our own houses clean, search our own hearts, remain true and

loyal and above reproach, and then openly proclaim the truth at proper times and places.

"Just at this time it is generally recognized there is a shortage of labor, although now and generally there are considerable numbers of idle men who do not ask for or desire steady work. For various reasons many workmen have returned to their homes in foreign countries. Business here was dull, and besides, these men on account of very large wage rates had accumulated money and believed themselves to be independent. The shortage in labor, however, has come principally as the result of the percentage immigration laws which have limited the number of workmen who would now come to this country if not prevented by the laws referred to. After some experience these laws are now believed by large numbers to be unreasonable. Ostensibly, at least, they were aimed at the sudden and large increases in the foreigners who were locating here, many of them entertaining views hostile to the ideas of our Government. These laws ought to be promptly changed. The restrictions upon immigration should be directed to the question of quality rather than numbers of foreigners coming to this country. Measures for limiting the number of immigrants to those who are clearly shown to be healthy, morally, politically and physically, ought to be clear, strict and enforceable; but the number allowed to come here should be equal to the necessities of our industries. The administration of the law could be under the control of a competent and impartial governmental commission or department, to be managed for the benefit of the general public and not for the protection of any special class or the exploitation of any impractical or injurious theory. This is one of the most important questions now being debated throughout the United States.

Will Soon Get Back

"In spite of the difficulties which have confronted industry and appreciably frightened investors, the manufacturers of steel are now producing, on the average, about 75 per cent of their estimated capacity. This is more than double the total capacity 20 years ago. We are making a better quality of steel, are increasing diversification of shapes for additional uses; and in many ways we are extending capacity and effecting economies, although selling prices have not kept pace with larger costs. We shall soon get back to a basis of business that will yield fair profits, if permitted to proceed without unreasonable interference.

"As to general business conditions, in addition to what has already been said, great significance should be given to the publications concerning the enormous savings bank balances. These show conclusively a disposition to economize, whatever may be the reasons. Economy and saving are fundamental to thrift and prosperity.

"In this greatest, richest, most admirable country, there should be the continuance of prosperity without prolonged depressions. The iron and steel industry can be a decided influence toward progress and stabilization."

The Electric Furnace in Refining Iron and Steel

Present Status and Reasons for World-Wide Expansion—

Rôle of Clean Steel—Flexibility of the Process

BY JOHN A. MATHEWS*

IT seems to have been generally overlooked by the steel trade that this year, 1922, marks the tercentenary of iron making in the Western Hemisphere. In 1622, the first iron was made at Falling Creek, Va., and in the same year the plant was destroyed and the workmen massacred by the Indians. It is a far cry from charcoal hearths and forges to the consideration of the electric furnace—the latest development in steel making processes.

*President, Crucible Steel Co. of America, New York. This is an abstract.

The rapidity with which electric furnaces have been installed within the last decade all over the world calls for some analysis as to cause. After 10 to 12 years of invention and pioneering there were about 125 furnaces in the world in 1912. At this time, Germany led with nearly one-third of the total number. To-day, as nearly as may be estimated, there are 1000 furnaces, 388 of them being in the United States according to THE IRON AGE figures for Jan. 1, 1922. Accurate sta-

(Continued on page 1130)



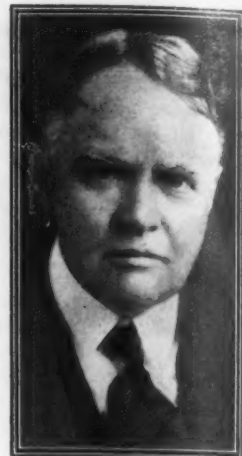
DR. H. F. BAIN



DR. J. A. MATHEWS



E. F. ENTWISLE



G. H. JONES

Authors of Papers Read at the Meeting of the American Iron and Steel Institute

H. FOSTER BAIN, director Bureau of Mines, Washington, author of the paper on "Modern Methods of Mining Coal," has had extensive experience in mining operations, for after graduating from Moore's Hill College, Indiana, and taking graduate work at Johns Hopkins University, he became associated with the Iowa Geological Survey, and leaving the Survey in 1900, went to Colorado, where he spent two years in Cripple Creek, managing a mining property. Later he was connected with the United States Geological Survey, the Illinois Geological Survey, was editor of *Mining and Scientific Press*, San Francisco, editor of *Mining Magazine*, London, and engaged in exploration work in South Africa. When the United States entered the war, Dr. Bain returned to the United States and became assistant director of the U. S. Bureau of Mines, giving particular attention to the speeding up of mineral production. At the signing of the armistice, Dr. Bain went to the Far East in exploration work for American interests. He returned to the United States, and on Jan. 1, 1921, was made assistant director and acting director of the U. S. Bureau of Mines. He was confirmed as director by the Senate in May, 1921.

DR. JOHN A. MATHEWS, president Crucible Steel Co. of America and author of the paper on the "Present Status of the Electric Furnace in Refining Iron and Steel," was born May 20, 1872, at Washington, Pa. He received degrees from Washington and Jefferson College, Columbia University, and attended the Royal School of Mines, London University, London. After serving for a time as instructor in chemistry at Columbia University, he became a metallurgist at the Sanderson works of the Crucible Steel Co. of America. He was made assistant manager two years later, remaining there until 1908, when he became operating manager of the Halcomb Steel Co., Syracuse, N. Y. He later became general manager and in 1915 president of the company, and at the same time was made president and general manager of the Syracuse Crucible Steel Co. He was elected a director and first vice-president of the Crucible Steel Co. of America, and was transferred December, 1919, to Pittsburgh, holding that position until November, 1920, when he was elected president of the company, which position he now holds. He was the first recipient of the Carnegie gold medal for research from the Iron and Steel Institute (Great Britain) in 1902.

EDWARD F. ENTWISLE, whose paper was on the "Economic Importance of the Power Plant in the Steel Industry," graduated from Cornell University in 1906. During 1906 and 1907 he was on power plant construction work for Ford, Bacon & Davis of New

York, at Nashville, Tenn. In the fall of 1907 he went to the Duquesne plant of the Carnegie Steel Co., working successively in the master mechanic's department, steam engineering department, and again in the mechanical department in charge of the installation of six Snow gas engines. After their installation he was placed in charge of their operation and also the operation of all steam power, blowing and water supply equipment. In 1914 he became mechanical engineer for the Maryland plant of the Pennsylvania Steel Co., and in 1916, upon the active acquisition of that company by the Bethlehem Steel Co., he was made mechanical engineer of the Steelton plant. During the latter half of 1917 he was appointed general superintendent of the Donaghmore division, comprising Bethlehem's blast furnace and ore concentration operations at Lebanon, and in 1918 he was again moved to the Steelton plant as assistant general manager, which position he now holds.

W. P. CHANDLER, JR., who read a paper on "Heating Furnaces for Blooms, Slabs and Billets," was born in Wilmington, Del., in 1889, and after attending the public Schools of that city and the Penn Charter School of Philadelphia, entered Cornell University in 1906, graduating in 1910 with the degree of mechanical engineer. He then entered the employ of the Carnegie Steel Co. at Clairton, Pa. After doing various work in the rolling mills and inspection department, he went into the steam engineering department and was steam engineer from 1914 to 1917. The following year he had charge of the boiler house for the Cleveland Furnace Co., Cleveland, leaving there to become assistant fuel and experimental engineer for the Carnegie Steel Co., at Duquesne, Pa. In August, 1922, he was promoted to become fuel and experimental engineer at that works.

G. H. JONES, president Hillside Fluorspar Mines, Chicago, who presented a paper on "Fluorspar and Its Uses," has been identified with the iron and steel business for 50 years, more than half of which was with the Inland Steel Co. Mr. Jones was one of the organizers of the Inland Company in 1893, and its remarkable progress was due in no small measure to his efforts. He resigned his position as first vice-president and general manager of the Inland Steel Co. on Jan. 1, 1922, and has since devoted his attention to the Hillside Fluorspar Mines, Chicago, whose mines are at Rosiclair, Ill. He was born in England, Jan. 25, 1856, came to this country in 1871 and for 22 years was associated with Hall, Kimbark & Co., wholesale iron and steel merchants, Chicago.



W. P. CHANDLER, JR.



G. R. McDERMOTT



C. L. KINNEY, JR.



H. H. STOEK

C. L. KINNEY, JR., who with G. R. McDermott presented a paper on "The Thermal Efficiency of the Open-Hearth Furnace," was born at Wareham, Mass., Aug. 4, 1876. He graduated from Massachusetts Institute of Technology, class of 1899, and was chemist for the Tremont Nail Co., Shickle Harrison & Howard Co., and Illinois Steel Co., South Works, 1899-1901. He was employed in the open-hearth department of the Illinois Steel Co., South Works, in various foreman positions and as assistant superintendent from 1902 to 1911, and has been superintendent of open-hearth plant No. 1 of the same works since 1911.

G. R. McDERMOTT, assistant engineer Illinois Steel Co., South Chicago, who was associated with C. L. Kinney, Jr., in presenting a paper on "The Thermal Efficiency of the Open-Hearth Furnace," was born in Glasgow, Scotland. He received his degree as mechanical engineer from Sibley College, Cornell University, class of 1905. Upon graduating, he became associated with the General Electric Co., Schenectady, N. Y., in its steam turbine engineering department. He returned to Cornell University two years later for post graduate work, also acting as assistant professor of thermodynamics as applied to heat-power engineering for a year and a half. Next he entered the employ of Westinghouse, Church, Kerr & Co., (now W. P. Robinson & Co.) and the New England Engineering Co. as superintendent of construction. In 1913, he accepted a position in the engineering department of the Illinois Steel Co.; appointed steam engineer in 1917, promoted to his present position in 1920. Mr. McDermott presented a paper before the 1921 convention of the Association of Iron and Steel Electrical Engineers entitled "Utilization of Waste Heat for Steam Generation." He is a member of the American Society of Mechanical Engineers and the Association of Iron and Steel Electrical Engineers.

R. C. HELM, author of the paper on "The Use of Liquid Fuel in Metallurgical Furnaces," received his technical education at the Pennsylvania State College, graduating in 1913. He took a position in the chemical laboratory of the Pennsylvania Steel Co., Steelton, Pa., for a short time. In the latter part of 1913 he accepted a position in the physical laboratory of the American Steel & Wire Co. as a laboratory assistant and was engaged in the study of various problems relating to the manufacture of both steel and copper wires, becoming later first assistant in the same laboratory. For the past four years he has been in charge of the Worcester district physical laboratory of the American Steel & Wire Co.

HENRY T. CHANDLER, author of the paper on the "Steel Requirements of the Automotive Industry," was one of the younger men who made valuable contributions to the meeting. He was born in 1890. He spent two years at the University of California, three years

at the Massachusetts Institute of Technology, one year at the Sorbonne in Paris and one and one-half years at the Polytechnic Institute in Zurich, Switzerland, specializing in physics, chemistry and mathematics. He was for five years with the Ford Motor Co. in its research laboratory, and has been employed by C. H. Wills & Co. as metallurgist for the past two years.

HARRY HARKNESS STOEK, professor in mining engineering at the University of Illinois, who read a paper on "The Storage of Bituminous Coal" was born in Washington, on Jan. 16, 1866 and was graduated from Lehigh University in 1887. In the following year, he was awarded a degree in mining engineering by that institution and in the same year was appointed assistant engineer with the Susquehanna Coal Co., Wilkes-Barre, Pa. Later he became instructor in mining, metallurgy and geology at Lehigh University. In 1893 he was appointed assistant professor in mining at Pennsylvania State College. For two years he was editor of *Mine and Minerals*, Scranton, Pa., being named as head of the department of mining engineering at the University of Illinois in 1909, a position which he still holds. Mr. Stoek is secretary of the Illinois Mine Rescue Commission, and a member of the Illinois Mining Investigation Commission, American Institute of Mining Engineers, Institute of Mining Engineers of Great Britain, Lake Superior Mining Institute, Western Society of Engineers and ex-president of the Coal Mining Institute of America. Among his writings are found: "The Anthracite Coal Field," "Economic History of Anthracite," "Education of Mine Employees" and "The Storage of Coal." Mr. Stoek's home is at 1203 West Illinois Street, Urbana, Ill.

JOHN V. FREEMAN who appeared with Prof. H. H. Stoek, of the University of Illinois in presenting the paper of "Storage of Bituminous Coal" was born at St. Ignace, Mich., in 1885, graduated from Ashland, Wis., High School and Chicago School of Assaying, later specializing in industrial organic chemistry at the University of Chicago. For three years, he was chief chemist of Lake Superior Iron & Chemical Co., now the Charcoal Iron Co. of America, at its Ashland plant. He became chemist to the coal and coke committee of the United States Steel Corporation in 1908, which position he has since held, working on the technical features of all coal and coke problems coming before that body, especially on questions regarding the by-products of coking coal and coal treatment processes. He is also a member of the Corporation's chemical committee compiling standard methods.

Under an order of the Wayne Circuit Court of Michigan, the receiver offered for sale Oct. 31 the Detroit Structural Steel Co.'s plant at Newburn Avenue and Six Mile Road, Detroit. The plant is only a few years old and was fully equipped for the fabrication of structural steel.

(Continued from page 1127)

tistics have been extremely difficult to secure during late years, but according to Dr. Richard Amberg* there are 65 furnaces in Germany engaged in the manufacture of ingots, with a yearly productive capacity of 430,000 tons and an unknown number of furnaces making steel castings with a capacity estimated at 300,000 tons per annum. I think we may estimate the total number of electric furnaces in Germany as about 100 to 110.

Reasons for Expansion

The reasons for the world-wide expansion of electric steel making are three:

1—Cheapening of wholesale power rates, due to hydroelectric and improved steam plant developments. Thus it is now commercial to use electricity for melting, whereas the original promoters of arc furnaces felt that their use would be of necessity confined to refining of metal premelted by the older processes.

2—The extreme flexibility and adaptability of electric furnaces to a wide range of uses. It has been shown by experience that they may be successfully used for melting cold charges or refining liquid charges, for making ingots or castings, and for melting ferroalloys. They may be used alone, or in conjunction with the Bessemer or open-hearth, or both. They may be operated acid or basic. They may be used in conjunction with the blast furnace or cupola for making gray iron, malleable and semi-steel castings. For foundry use particularly, the small units are advantageous for making frequent small heats of steel or iron castings.

The most popular size of electric furnace in this country is of 6 gross tons capacity, but furnaces from $\frac{1}{2}$ to 40 tons capacity have proved equally successful. In furnaces of 6 tons, or a little larger, hand charging is general, but in the larger sizes either mechanical charging of cold materials or the use of hot metal charges is usual. Duplexing of open-hearth steel is practiced in many of the larger units, while triplexing is done at the great installation at the Illinois Steel Co., as described at the institute a few years ago by T. W. Robinson.†

All of the manifold methods of operation are possible with the use of arc furnaces, which are by far the most frequently used, here and abroad. Of the different types of arc furnaces in the United States nearly one-half are of the Heroult type and considerably more than one-half of the productive capacity is represented by them.

The electric furnace has small possibilities in this country for the manufacture of pig iron from the ore, but during the war period several furnaces were used to make so-called synthetic pig iron from turnings and borings and other light scrap, in the United States, Canada and France. In Sweden, Norway and Italy, where metallurgical fuel is very dear and electricity is cheap, electric smelting of ores is an established industry. The world's production for 1921 is placed at 377,900 tons, and most of you will recall that the year 1921 was not a good year for high records.

3—Quality of products. A new process to succeed must be cheaper in operation or produce a better quality. The cost of electric steel is rarely lower than open-hearth and never lower than Bessemer and therefore its success is presumably due to its producing a generally superior product. Of course there are especially favored localities or peculiar market conditions which warrant the installation of small electric furnaces where open-hearth and Bessemer installations would be out of the question. In the same localities and markets electric furnaces do operate successfully alongside of large tonnage plants and under such conditions quality must be the principal reason for success rather than low cost.

It is quite obvious that this country has not installed 1,500,000 tons of productive electric capacity to compete with the present crucible capacity of one-tenth that vol-

ume. In an address several years ago I said: "It is seldom that a process is discovered that cannot be improved upon. Crucible steel is an exception to this rule. This earliest process makes the best steel and has never been surpassed." The superior lasting qualities of German guns were often ascribed to the use of molybdenum, zirconium, uranium or other strange alloys, but my own idea is that the use of clean, well-melted crucible or electric steel is a more probable explanation. Crucible steel was employed for many submarine crankshafts, and apparently the Germans recognize that when fabricating and machining costs are far in excess of material cost, and where dependability is a vital necessity, it is a poor policy to save at the spigot and let out at the bung hole. Quality depends upon the selection of raw materials, the process of melting and subsequent care in forging and heat treating. The electric furnace provides a reducing atmosphere in which sulphur is readily removed and with it goes one of the generally recognized inclusions, manganese sulphide, and the same condition serves to eliminate oxides.

Importance of Clean Steel

The electric furnace, therefore, is a potential source of clean steel which is more highly appreciated than formerly, and the electric product is opportune to meet the new and exacting requirements for ordnance, automobiles and airplanes, and other devices in which alternating stresses are very severe. The importance of clean steel has been observed in the course of extensive investigations of the fatigue of metals under the direction of Prof. H. F. Moore. It is not too much to expect that the higher the elastic or proportional limit resulting from heat treatment, the more serious would become defects such as non-metallic inclusions and seams in parts made from inferior steel. Dr. McCance confirms this in stating that fatigue failure under repeated stress is a progressive failure, starting in all cases in some defect or irregularity either of internal structure or external surface.

By way of illustrating the freedom from inclusions in electric steel I might mention the result of actual count of hairlines, due to inclusions, in the ground surface of steel to the same chemical specification—a chrome-nickel steel for aeroplane crankshafts. As the result of tests on several heats of this steel by the basic, and acid open-hearth and basic electric process, the average count ran in the ratio of 8 to 4 to 1, and the hairlines in the electric steel were much shorter than in the steel of open-hearth manufacture. Another illustration from my own experience may be convincing. In one of the races at the Indianapolis Speedway a few years ago, about one-half of the cars starting did not finish because of failure of vital parts. The following year nine or ten cars, which I knew contained our electric furnace product in their important parts, all finished the race without mishap, and included the winning car. A practical demonstration of this kind is more eloquent than columns of figures of laboratory tests.

The recent paper by W. J. Priestley* outlines the splendid results of electric furnace ordnance steels made at Charleston, W. Va., in the largest furnaces in the United States. He shows that the results are due to clean steel and freedom from oxides, sulphur and phosphorus. These results show that large units, with proper handling, can produce very high quality steel, and we see no reason, now that larger electrodes can be made of dependable quality, why a 60 or 80 ton furnace cannot be expected to give relatively as satisfactory results. The electric steel rail is still a desired possibility. The increased demands made upon materials of construction call for new methods for meeting those demands. As I stated here six years ago, the electric furnace was opportunely invented to meet a new demand rather than to replace an old process.

It would be mere repetition to restate here the various types of furnaces, such as arc, induction, radiation, etc. They have been described in books and technical magazines and we need only observe in passing

*Electric Furnaces in the Iron and Steel Industry, Helios, vol. 28, p. 169, for April, 1922.

†The Triplex Process of Producing Electric Steel at South Chicago, Yearbook, American Iron and Steel Institute, 1918, p. 115.

*Effect of Sulphur and Oxides in Ordnance Steel, Transactions, American Institute of Mining and Metallurgical Engineers, vol. LXVII, p. 317 (1922).

that there have been no new principles of heating employed since the first few years—with the possible exception of Dr. Northrup's high frequency induction furnace, which has not thus far been successfully employed in units of commercial size in the steel industry.

Mechanical and Electrical Refinements

Of mechanical and electrical refinements there have been many, all in the nature of improvements in regulation and economy. Among these may be mentioned two of American origin, J. A. Seede's automatic electrode regulator, and E. T. Moore's peak-load regulator. The principle of dual, or rather multiple, voltages was embodied in our original installation in 1906, but its metallurgical significance was not so apparent as it was later when we installed a process employing a 220 volt arc and with considerable difficulty succeeded in persuading the inventor that provision for a lower voltage for use during the refining period must be provided. The desirability of relatively high voltage for melting and low voltage for refining is now generally recognized. Many improvements have been made as the shortcomings of the earlier furnaces appeared, such as well-fitting doors, water-cooled arches, better electrodes and holders and economizers to cut down oxidation and waste of the electrode. In my own experience I have seen electrode costs per ton of product as high as \$8 gradually decline to 35c. This was in a furnace refining molten charges.

The electric furnace is also a recognized factor in

melting non-ferrous alloys, such as brass and Monel metal, as well as special alloys such as nichrome, "rezistal" "stellite," stainless steel, manganese steel and high-speed steels, besides an endless variety of the simpler alloy and carbon steels from the mildest to the hardest tempers.

Versatility of the Electric Furnace

As stated earlier in this paper, its astonishing flexibility—versatility, we might call it—has attracted the attention of the metallurgical world in almost every branch of smelting, melting, refining, heating and even baking metals. To those of us who have watched its growth from the start, it seemed very slow in achieving the recognition we felt must inevitably come to it, but at last our early confidence has been confirmed in every steel-making country, because its products have fulfilled almost every expectation in every field wherein it has been thoroughly tried. The present success is due not only to the original inventors of the basic processes, but also to the active co-operation of the great manufacturers of electrical equipment, furnace designers and builders, makers of refractories and electrodes and a group of earnest metallurgists in many individual plants who have studied every detail of operation.

When users acquire a full appreciation of what clean sound steel means in terms of national efficiency, safety and economy we shall see more rapid growth than has as yet been seen. Its usefulness to engineering and industry has just begun.

Design of a Proposed 100-Ton Open-Hearth Furnace*

Thermal Efficiency and Heat Balance of a Furnace of 1912 and One of 1922

BY C. L. KINNEY, JR., AND G. R. McDERMOTT†

AT the outset the authors suggested that the American Iron and Steel Institute appoint a committee to prepare and sanction some standard method of determining the thermal efficiency and heat balance of the open-hearth furnace, and they further suggested that those members who manage such plants pledge themselves to use in investigations the standard method authorized by the committee. They regard the method used by Fred Clements in his paper on this subject, which appears in the *Journal of the Iron and Steel Institute* (London), 1922, (*THE IRON AGE*, July 13) as the most simple and practical of any extant, and in their presentation very largely followed his plan.

Their paper covered an investigation to determine the present efficiency and heat balance of a typical open-hearth furnace as operated at the works of the Illinois Steel Co. and to show what improvements have been made and wherein the losses shown may be minimized. With this in mind they showed a design of a 100-ton furnace in which are embodied certain improvements.

The proposed 100-ton furnace has been provided with insulated checker chamber walls only, but no increase of combustion chamber efficiency has been assumed. We are satisfied to show that the heat conserved by this insulation is of advantage in our waste heat boiler only. It may be asked why the checker chamber roofs are not so insulated, thus further conserving heat. To this question we will reply by saying that the peak temperature in these chambers is at present not far below the softening temperature of fire-brick and it is felt that any great increase would involve chamber roof collapse.

The checker work shown in the drawing of the 1922 and 100-ton furnaces was designed to give the

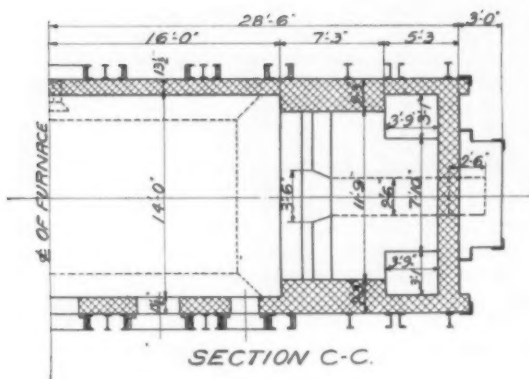
greatest possible inlet area (number of top openings per square foot of horizontal area) and the maximum square feet of exposed surface per cubic foot of checker brick, but also, in its individual flue area of 36 sq. in., gives a velocity high enough for a very excellent rate of heat transfer without premature clogging and consequent suspension of efficient operation.

With checkers as shown in the furnace of 1912 and burning Universal mine run coal (which has an average proximate analysis as follows: volatile, 35 per cent; fixed carbon, 45 per cent; ash, 8 per cent; moisture, 12 per cent; B.t.u., 11,445), the average amount of coal per ton of ingots produced was 750 lb., and over an equally long period during 1914, using the improved checker work and the same coal, the pounds per ton of ingots was reduced to 684, a decrease of 8.8 per cent. Had we been using, during the periods named, what may be termed a standard gas producer coal of high fixed carbon, low ash and moisture content, having a heat value of 13,400 B.t.u., our coal per ton of ingots would have been for the 1912 period, 600 lb. and for the 1914 period, 548 lb., this last figure representing actual results. It should be unnecessary to mention the desirability of the proper arrangement and size of flues under the checker work, and we have attempted to minimize short-circuiting by progressive increase in area from bridge-wall to valve flue, at the same time keeping ample area in all parts in order to take care of deposited oxides. Ample insulated flue area, between regenerative chamber and valves and boiler, has also been provided.

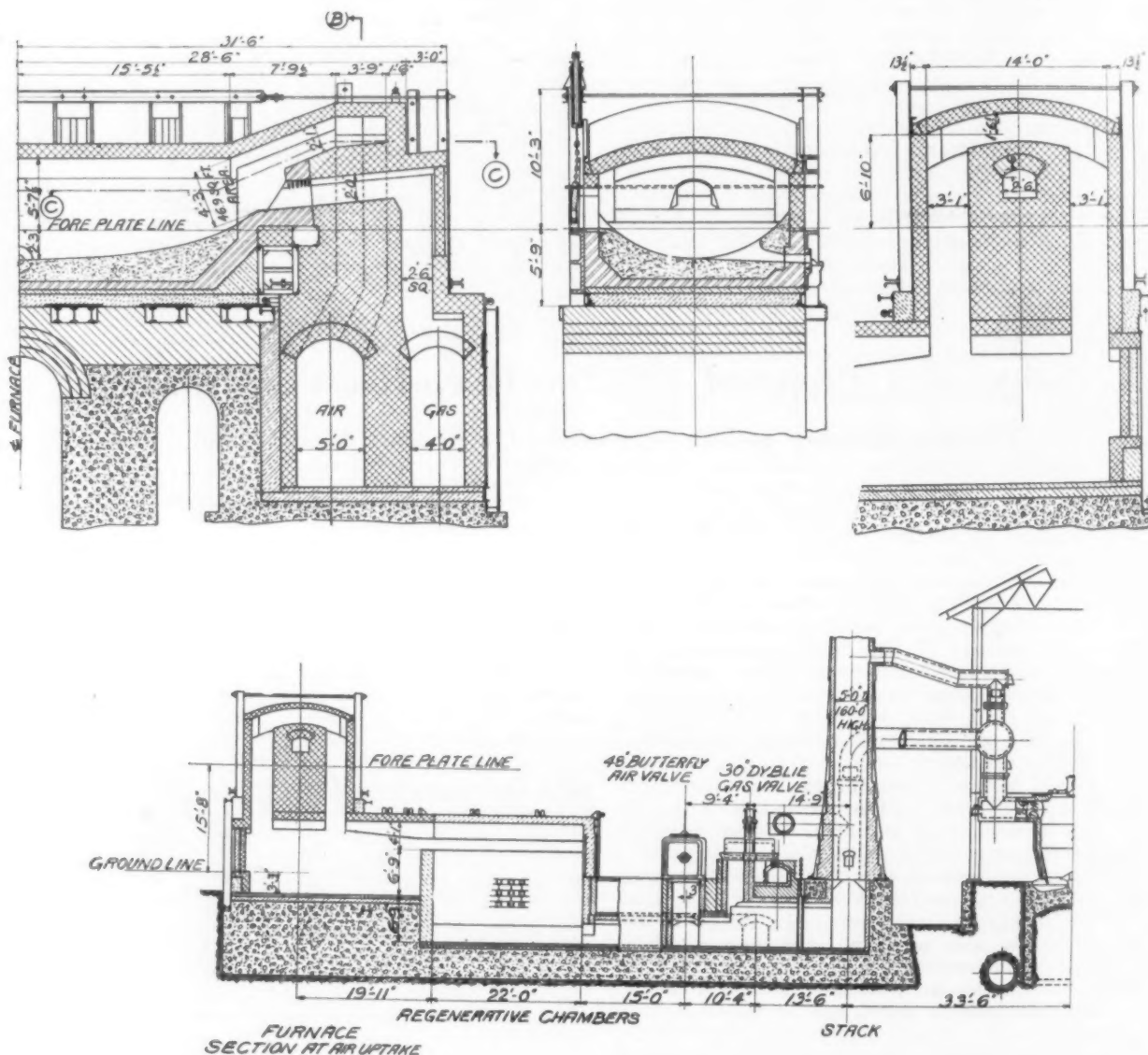
Today it is not unusual to find furnaces, the face of whose gas ports are too far advanced into the melting chamber and the bottoms of the ports not high enough above the bath level. The antithesis of such a condition prevails where gas ports are set too far back, thus causing a very high temperature flame to play upon and pass over the end banks. With this condition these banks will soften and cut instead of building out and trouble will be encountered in the

*Abstract of paper read before the American Iron and Steel Institute, New York, Oct. 27.

†Superintendent No. 1 open-hearth department and assistant chief engineer, respectively, South Chicago Works, Illinois Steel Co., South Chicago, Ill.



The 1912 Type of Open-Hearth Furnace Required 750 Lb. of Coal of 11,445 B.t.u. Calorific Value to Produce 1 Ton of Ingots. This, measured by 14,000 B.t.u. coal, is 600 lb. By an improvement in the checker work, such as indicated in the 1922 type of furnace, the coal consumption was 684 lb. and 548 lb., for the two kinds of coal, respectively



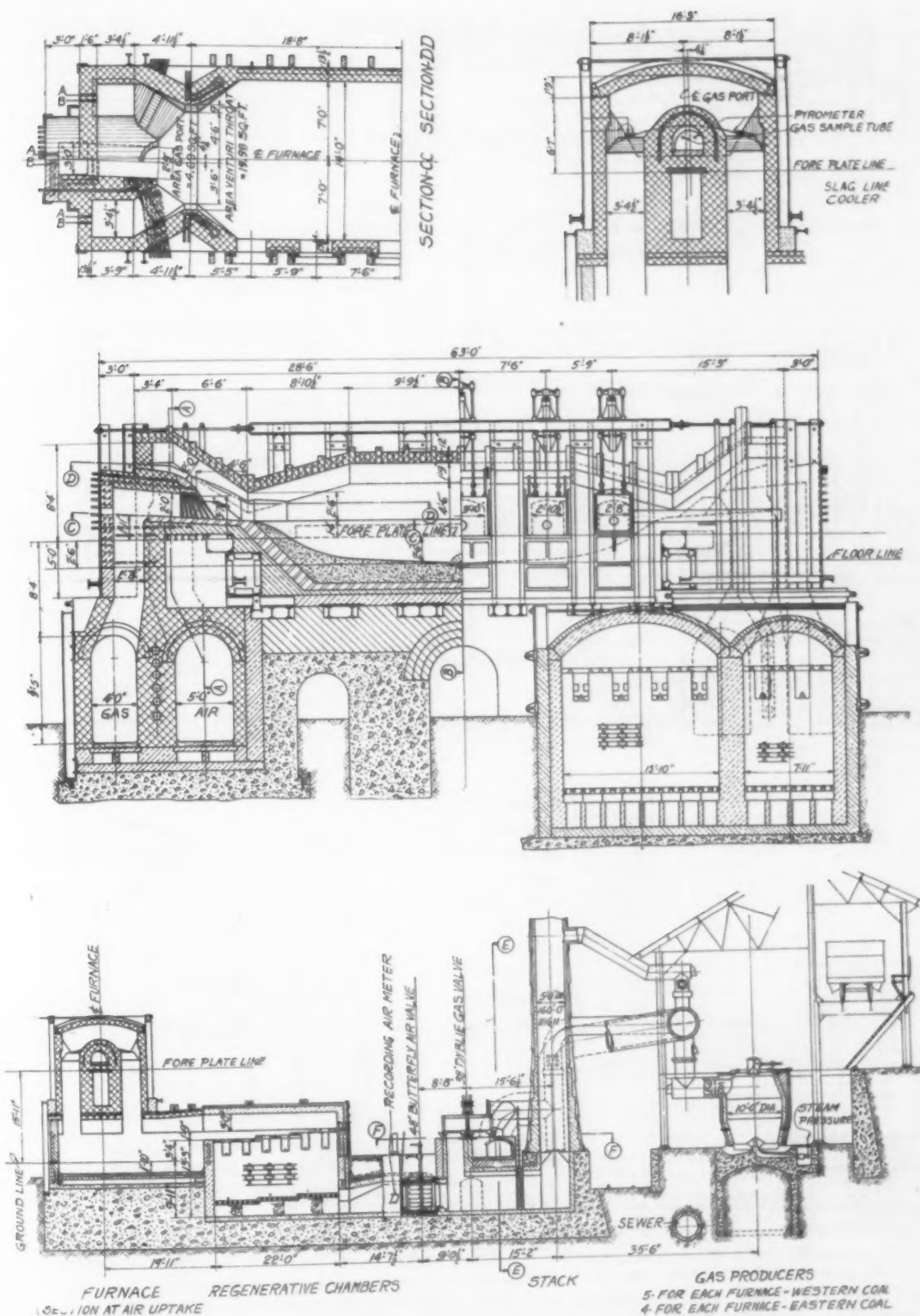
form of delays in repairing them, and in the loss of heats.

Reference to the port end of 1912 type of furnace will show that, while a preliminary combustion zone existed, there was a decided lack of contact area between incoming gas and air. A cross section of the combustion chamber at the gas port mouth shows that only the upper portion of the producer gas column is in contact with the air column. The 1922 design shows how this area of contact has been increased by the admission of air on the sides of the gas port. The proposed 100-ton furnace exhibits another arrangement in this respect, in that the fuel column is divided and by means of the damper the air is forced into a still more intimate contact.

Referring again to the 1912 type, it will be noted that, after leaving the zone referred to, the area of greatest confinement was 43 sq. ft., and the continuity

of direction and compactness of the fuel column was largely a matter of velocities and confinement in the zone immediately adjacent to the gas port mouth.

To maintain the proper direction and compactness of the fuel column under the 1922 condition of preliminary combustion, it was necessary to prevent velocity dispersion, by decreasing the area of confinement to 20 sq. ft., which is practically the amount indicated by the increased volume of the gases, due to their temperature increase between the face of the entering port and the point of greatest confinement. Not only does this decrease in area (23 sq. ft.) result in a regular compact fuel column, but by increasing the intimacy of the mixture of gas and air an improvement in combustion is attained. Such reduction in area does not, as might be supposed, affect the efficient removal of the products of combustion from the melting chamber.



The 1922 Type of Open-Hearth Furnace, Besides the Improved Checker Work, Shows Improved Port and Melting Chamber Design, Reducing the Coal Consumption per Ton of Ingots to 596 Lb. and 477 Lb., for the 11,445 and 14,000 B.t.u. Coals, Respectively

The 100-ton furnace not only increases intimacy of mixture for the necessary combustion, and the confinement of area necessary for efficient control of the flame, but in addition provides an outlet area capable of handling a greater input energy.

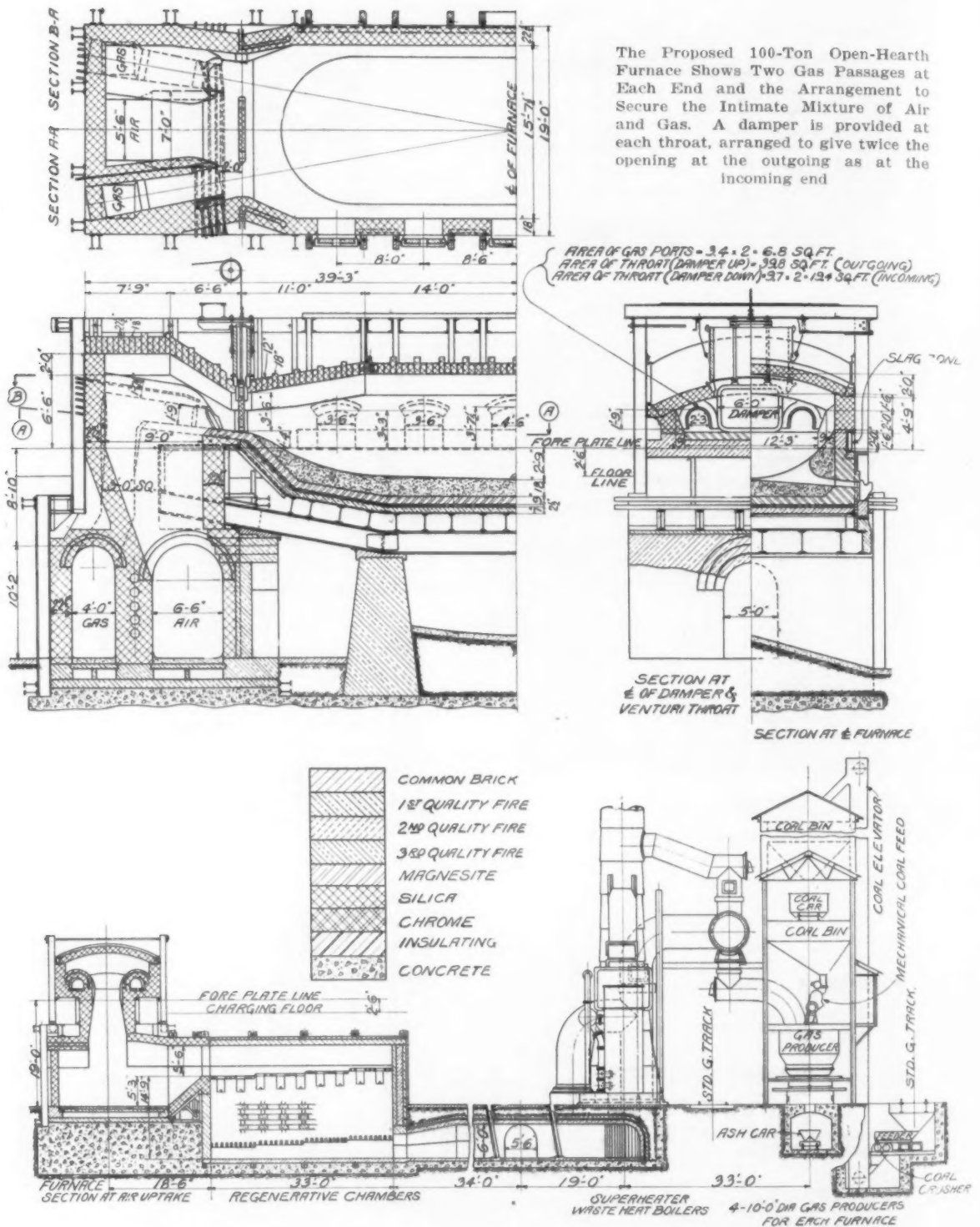
The furnace drawing shows the air-cooling system for the division walls between slag pockets and checker chambers. This is connected to a fan which supplies air to the furnace. This arrangement increases circulation and renders cooling more efficient and adds sensible heat to the incoming air.

The 100-ton furnace shows a substitution of the damper type valve for the rotating water-cooled type and while there is no question of the superiority of the former due to its easier flow lines, there is also much less heat loss in the cooling-water and the absence of

water vapor carried into the furnace from the exposed water of the seal. It should be emphasized that a valve of this type, used on the air flues, eliminates the short-circuiting of a larger or smaller portion of the incoming air to the stack flue, which in the butterfly type comes from faulty sealing of the valve tongue and entails losses more serious than commonly supposed.

The sensible heat in the gases after passing through the regenerators of an open-hearth furnace represent 30 to 50 per cent of the heat available in the fuel as fired. The absorption of the heat content of these gases is largely obtained by convection which necessitates the travel of the gases at high velocity over the heating surface of the boiler.

By referring to 100-ton furnace drawings it will be noted that a fire-tube type of boiler and economizer



is shown. Both the boiler and economizer are constructed with 3-in. flues. The reduction of space required, lower first cost, less draft loss, elimination of air leakage due to infiltration, and ease of maintaining a clean surface on the gas side of the heating surface for equal evaporation led to the adoption and installation of the fire-tube type of waste heat boiler at South Chicago in 1915 and in 1917.

The heating surface of the boiler and economizer constructed with 3-in. flues is 6250 and 2200 sq. ft. respectively, while the number of square feet of heating surface of the boiler constructed with 2-in. flues and an economizer having 3-in. flues is 3100 and 2200, respectively. The latter installation would consume more fan power on account of the greater friction loss through the 2-in. flues as compared with the 3-in. flues. The cost of this power would be offset by the difference in first cost of the installation and interest on the investment.

The furnace equipped with a waste heat boiler utilizes as useful work 35.9 per cent of the energy in the coal fired at the producers, as compared to 16.1 per

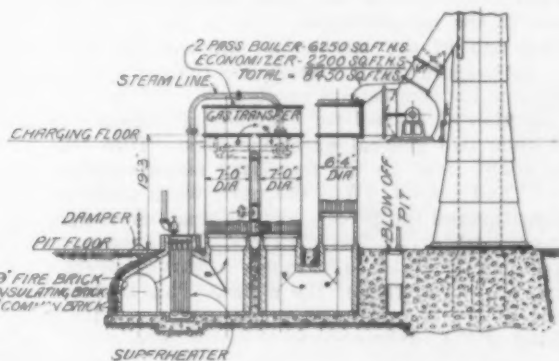
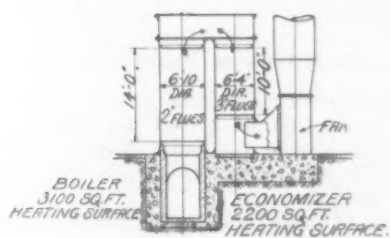
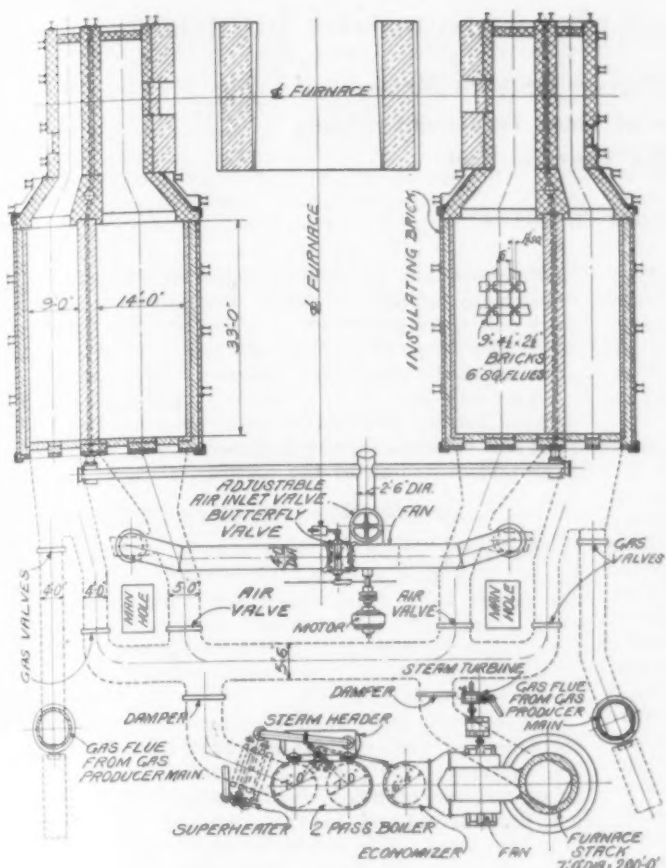
cent with the furnace not so equipped. This difference would be further increased by the installation of an economizer.

The authors took observations of three successive heats of No. 24 furnace at the No. 2 plant of the South Works of the Illinois Steel Co.

The heat balance shows a total heat input of 531 million B.t.u. in the coal fired in the gas producers, of which 493 million B.t.u. was delivered to the furnace gas valve, no allowance being made for the tarry vapor content of the gas. Of this 531 million B.t.u., the principal losses are given in the accompanying table.

Principal Heat Losses in Open-Hearth Furnace Operation		
	Millions of B.t.u.	Loss in Per Cent of Coal Fired
Carbon monoxide in waste gas sampled at port ends.....	53.5	10.01
Heat radiated from checker chambers, slag pockets and uptakes....	38.9	7.3
Total heat absorbed by cooling water (not including gas valve).....	71.75	13.5
Heat absorbed by gas valve.....	10.75	2.0
Heat in waste gas to boiler.....	270.00	51.0

The heat in useful work in the steel produced



The Proposed Open-Hearth Furnace Installation Comprehends Using Forced and Induced Draft Fans in Connection with a Waste Heat Boiler and Arrangement to Supply Air in Proportion to the Fuel Consumed. Division walls between slag pocket and checker chamber are air-cooled, being connected with supply fan.

A one or two pass boiler is indicated, the latter type with both superheater and economizer

amounted to 85.29 million B.t.u. or 16.1 per cent of the B.t.u. contained in the coal fired. The net heat recovered by the waste heat boiler, after deducting the heat in the steam used for blowing the five gas producers was 87 million B.t.u. or 16.4 per cent of the B.t.u. in the coal.

Dimensions of Open-Hearth Furnaces Compared

	1912 Type	1922 Type	Authors' 100-Ton	Clements' 100-Ton
Distance between gas port faces, ft.	39	43	54	48
Width between front and back walls, ft.	13.25	13.25	15.75	16
Length of hearth, ft.	32	32	42	38
Hearth area per ton of ingots, sq. ft.	5.73	5.73	6.75	6.08
Area of gas port, sq. ft.	4.7	4.7	6.8	3
Area of air port, sq. ft.	24.5	38	42	7.8
Area of mixing throat, incoming, sq. ft.	46.9	20	19.4	abt. 19
Area of mixing throat, outgoing, sq. ft.	46.9	20	39.8	abt. 19
Length between mixing throats, ft.	30.9	37.3	50	37

The apparent loss in the form of unburned carbon monoxide is in part recovered by secondary combustion in the checker chamber and largely appears as additional heat in the waste gases utilized by the boiler. This large loss of the furnace is uneconomical from the standpoint of furnace efficiency, and may be corrected in a large measure by improving melting chamber combustion.

Some 38.8 million B.t.u. are lost by radiation from checker chambers, slag pockets and uptakes, and we would expect in the 100-ton furnace to prevent a portion of this by insulation of the checker chamber walls.

The gases leaving the waste heat boiler can be further utilized by means of a feed water economizer to the extent of approximately 8 per cent additional steam generation, as demonstrated by a recent installation at these works.

To further an increase of efficiency we propose to install a fan or other mechanical means of delivering air, which is automatically controlled supply air for effective combustion. The automatic control feature will supply air in proportion to the fuel consumed. This air control will operate in combination with an automatic control for the removal of the waste gases which must maintain a balanced draft in the melting chamber.

The port construction of the proposed furnace as shown is purely theoretical, the soundness of the design and expected results to be proved by actual construction and operation.

An accompanying table gives a comparison of the important dimensions of the three types of furnaces discussed; and as a matter of addi-

tional interest the authors show the same data for the 100-ton furnace designed by Fred Clements, Rotherham, England. (Shown in THE IRON AGE of July 13, page 75.)

Managers in 10 basic industries are enlarging their work-forces to keep production abreast of the growing demand developing with the general quickening of business, according to reports made to the Department of Labor at Washington. The percentage of increase in a few industries is as follows: car building and repairing, 15.8 per cent; shipbuilding, 4.7; automobile manufacturing, 5; electrical goods and machinery, 2.2. There has been a decline in the numbers employed in farm implement production, but this is attributable to the usual seasonal slacking in demand.

The University of Michigan has announced that its new engineering shops and laboratories, which will be ready for the opening of the U. of M. in the fall of 1923, will cost approximately \$750,000. There will be a foundry under the direction of the metallurgical department, a pulp and paper laboratory, motor fuels and petroleum laboratory, paint and varnish laboratory, asphalt, tar and cement laboratory.

Steel Requirements of the Automotive Industry

Classified as to Various Parts—Tests for Mechanical Properties—Importance of Heat Treatment—Alloy Steels for Certain Parts

BY HENRY CHANDLER*

PRIMARILY, the physical properties of automotive steels determine which of those steels are best adapted and most essential to the automotive industry. Speaking generally, the mechanical characteristics of materials determine, first, the thing we are able to make, and second, the methods we are to employ in making it.

The more highly specialized an industry becomes in its development, the greater is that industry's dependence upon the properties of the metals peculiar to it. Our first thoughts in the development of a mechanical idea are governed by and limited to the materials then available. Later, competition and a fuller understanding of our actual needs result in the discovery of materials still more suitable. For instance, in the early pioneer days of the motor car industry, crankshafts were made from billets intended for rails, gears from tool steel, cylinders from iron suitable for stoves and, similarly, all other parts were made of the only materials then available.

To-day we rely upon specialized automotive steels for our major parts. The automotive manufacturer is now buying physical properties. The chemical specifications, from which steels are actually purchased, are not of importance in themselves but only for the physical characteristics which they define. It is the mechanical characteristics of the steels that are of prime importance to the manufacturer, both in the design of his product and in the mechanical methods he is to employ in manufacturing it. These are the two factors that determine his commercial success.

The adoption of a steel for commercial purposes is predicted upon two general questions; first, "How will this steel adapt itself to the necessary manufacturing processes?" and second, "Will the part, when made of this steel, withstand the forces, such as wear, breakage, etc., that operate for its destruction?" The answer to these questions is obtained through a survey of the mechanical characteristics of the metal. This two-fold importance of the physical properties suggests a natural division of the various parts of motor cars.

Steels Suited to Fabrication

Our first group will contain all those automotive parts which are made from steels in which the physical properties, that control the processes of fabrication, are of first importance. This group includes most of our sheet metal parts, low stressed bolts, nuts and other screw machine products, as well as miscellaneous forgings, hardware and stampings. The requirements are easily and quickly ascertained. Actual use becomes the best criterion and we are able to define our steels in terms of how they must behave in the shop.

Steels for Service Conditions

The second group contains those special automotive parts which are made from steels in which the physical properties demanded by service conditions are unusual and of first importance. Steels for such parts, due to the peculiar conditions of service to which they are subjected, must have individual physical properties developed to an unusual degree. Valves, ball bearings, magnets, armatures, hardened keys and the like are all typical of this class.

For example, in valves, strength, hardness and toughness must be maintained at high temperatures and the metal must withstand the corrosive and erosive effects of the products of combustion. To meet these particular requirements, many special steels have been developed, such as high-tungsten, silicon-chromium,

cobalt-chromium and others, each with its own peculiar advantages for this service, and each with its own distinct engineering following. Also the electrical properties now attained in armature and magnet steels are evidence of the specialized nature of these parts.

Naturally this group requires special analyses. The manufacture of these parts or of the steels suitable for them can be commercially undertaken only after a thorough understanding of the complex problems involved.

Steel for Major Automotive Parts

The third group contains most of our major steel parts. The front axle and its various component units; our power train from piston pin, through connecting rods, crankshaft, transmission, universal joint, to the rear axles; springs; heavy duty gears; and, in general, all parts subjected to live loads of a high order are included in this division.

These parts are uniquely automotive parts, that is, the forces of wear, fatigue and breakage to which they are subjected; the processes by which they are fabricated and the economic factors which limit their cost are peculiar to and characteristic of the automotive industry alone. The steels for these particular parts may, therefore, be truly called "automotive steels." Their development into the many standard grades of alloy steels has been coincident with and in a large measure responsible for the development of the motor car. Parts in this group, in operation, are subjected to much punishment.

Tests to Determine Mechanical Properties

The automotive manufacturer relies upon two types of test: First, that of actual use itself, and second, comparatively simple and rapid laboratory tests, whose indications he has learned to correlate with the results of actual use.

The test of actual use, while undoubtedly our final criterion, nevertheless has serious disadvantages. It is generally slow and its results are difficult to express in terms usable in steel specifications. Laboratory tests, whose results may be numerically expressed, have been devised to furnish us with information as to the likely behavior of the metal in service.

It is not yet easy to say which and how many of the various physical properties, which metals possess, are of direct importance in the construction of these automotive parts. The conditions under which a motor car must operate are unusual. Dynamic tests, designed to isolate and measure the physical properties which determine the behavior of steel under these conditions, have been suggested. Of the many properties easily measured, the automotive manufacturer depends chiefly upon those obtained by the following tests:

First, the tensile test.

Second, the Brinell and scleroscope hardness tests.

Third, an impact test (in this country generally the Izod).

Fourth, thermal and metallographic investigation.

These tests, while not conclusive, nevertheless, when properly interpreted and supplemented by close observation of actual service, sufficiently define our steels for commercial purposes. [The author here discusses each of these methods of testing and what they mean.]

Effects of Heat Treatment

Steels for the parts now under discussion are invariably used in the heat treated state. The behavior of the steel under thermal treatment also bears a relation to its dynamic characteristics.

When a piece of steel is heated beyond its critical

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This is an abstract.

point, it undergoes a chemical and physical transformation. If thereafter it be slowly cooled, this transformation reverses itself and the material returns to its normal state. However, when the steel is quenched, the physical and chemical changes which took place during the heating have now no opportunity to reverse and the material, when cool, is consequently in a state of unstable equilibrium. This degree of instability is measured by the temperature to which we can subsequently reheat or "draw" the steel after quenching and still maintain our requisite strength. In other words, the higher the drawing temperature that the steel can withstand, the greater is its molecular stability and the greater is its resistance to any subsequent molecular change, whether the latter be produced mechanically or otherwise.

Other factors being equal, the steel with the highest drawing temperature will be the most satisfactory for those automotive parts that require resistance to "fatigue."

But here again caution must be exercised lest our conclusions carry us beyond a logical point, because the metallographical size, nature and distribution of the constituents of the steel are also factors to be reckoned with.

We have indicated in the preceding paragraphs that the merit of a steel for motor car use was closely related to the results of the tension test; and that this relationship might be expressed by the proportion:

$$\frac{\text{Mean Breaking Strength} \times \text{Elongation}}{K - \text{Reduction in Area}}$$

It is perfectly obvious that such a simple proportion as the above can in no way be an exact statement of the really complex relation which exists between the phenomena occurring in the tensile test and the exceedingly complex combinations of properties required for our various parts. Nevertheless, since this test so greatly influences the automotive manufacturer in his choice of steels, we are justified in considering what further information it can supply us with.

The physical properties of our steels are direct functions of the drawing temperature. Thus the elastic limit, elongation and reduction in area may all be varied over wide limits by heat treatment. It therefore follows that our merit number, as previously computed, will also change in value according to changes in the drawing temperature and will in a given steel reach a maximum at some definite temperature.

For example, a hardened but not drawn bar of high carbon steel may show an elastic limit of say 175,000 lb. per sq. in. Nevertheless, it can be readily seen by breaking the bar with a hand hammer that this strength is of little use for the parts under discussion. Due to the slight elongation and reduction in area possessed by the bar, these factors in our equation will be small and our merit number will be very low, in spite of the relatively high elastic limit. If we now reheat or draw the bar, we find that although of less strength as measured by elastic limit, it will easily withstand our efforts with the hand hammer. A further increase in temperature still further increases the amount of energy which must be expended before breakage occurs, until a maximum point is reached where the decrease in ten-

sile strength and elastic limit is not compensated for by the corresponding increase in elongation and reduction in area. Further elevation of the drawing temperature beyond this point results in a decrease in merit until the critical point is reached, with its accompanying fundamental changes in qualities. This drawing temperature at which maximum merit occurs is different in different types of steel and is fairly independent of the carbon content. This consideration is important in comparing the suitability of the various steels for different uses and in defining our practice in allotting a particular analysis of any given type of steel to a particular part.

Thus we find that the steels in which this temperature of maximum merit is naturally low are used exclusively in the condition resulting from low drawing temperatures. This is the case with silico-nickel steels which are widely used for hard light armor plate.

Our most widely used spring steel is of an analysis which develops the necessary spring requirements of strength, etc., at a drawing temperature but 60 deg. removed from the temperature of maximum merit for that steel.

It is common practice in the manufacture of large carbon steel forgings to meet the elastic limit requirements in so far as possible by carbon additions and thus maintain a high drawing temperature. Since there is, then, a definite drawing temperature, at which the dynamic properties required in automotive steels are developed to their maximum, for each particular steel analysis, there is, consequently, a corresponding definite elastic limit at which the particular steel may best be used.

Most of our major automotive parts require, owing to the limitations imposed by design, minimum strengths of a relatively high order. Also the successful operation of these parts, under the difficult service conditions, presupposes the development of the merit index to a high degree.

Alloy Steels for Certain Parts

Carbon steels may develop under suitable heat treatment elastic limits which are sufficient for most of these parts, but their use is promptly excluded where the requirements exceed 80,000 lb. per sq. in., and even for requirements under this figure the merit index is of a lower order than is desired.

Accordingly, our automotive alloy steels have been developed, which not only will show higher elastic limits than those obtained in carbon steels, but also for any given elastic limit, demanded by design, will exhibit resistance to fatigue, vibration, shock and wear, far greater than that of any carbon steel.

This development has been coincident with and in a large measure responsible for the development of the automotive industry.

The commercial factors, as defined by the adaptability of these materials to the various mill processes of manufacture and the subsequent operations of fabrication, such as machineability and general adaptability to shop conditions, have in a like manner been improved until it may now be fairly said that through the use of alloy steels, the automotive manufacturer can build a better product at a cheaper price.

Liquid Fuel in Metallurgical Furnaces

Handling and Burning Tar and Fuel Oil—Use in the Open-Hearth and in Heat Treating Wire

BY R. C. HELM*

TAR and fuel oil are the most common of the liquid fuels which are economically available for use in metallurgical furnaces and this paper has, therefore, been confined to their use only.

The use of oil as a fuel in furnaces for metallurgical

purposes dates back a good many years, and the demand for it is constantly increasing. Originally, the oil was used in its crude form without the removal of any of the more volatile hydrocarbons. Naturally, the low flash point of such oils made them unsafe to handle. Moreover, the development of wider uses for these lighter oils demanded their extraction from the crude. The removal of these lighter hydrocarbons raised the

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flash point of the residue considerably, giving a resultant product which could be used with more safety. A large proportion of the oil now used as fuel is obtained as a residue in this manner.

The calorific value of the fuel oils in common use varies from about 141,800 to 152,400 B.t.u. per gal. with corresponding density as measured by the Beaumé hydrometer of 30 to 12 deg. at a temperature of 60 deg. Fahr. As oil is purchased by the gallon, the heavier but more viscous fuel oils, therefore, have the higher ther-

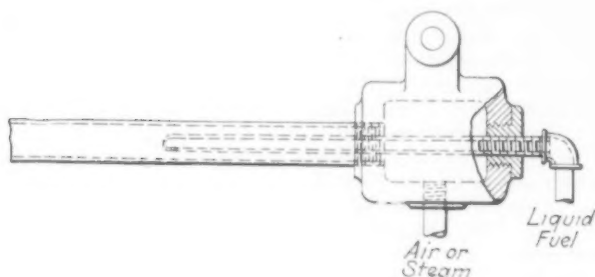


Fig. 1—Liquid Fuel Burner for Open-Hearth Furnace

mal values. The thermal value of the oil, however, does not necessarily indicate its adaptability for furnace use, as other features such as the content of impurities and size of furnace installation must be taken into consideration in deciding whether the heavy and more viscous oils should be used in preference to the lighter and more fluid oils.

The introduction of the by-product coke plant increased the available amount of coal tar to such an extent as to result in making coal tar available as a liquid fuel for use in metallurgical furnaces. In addition to tar, the by-product coke plant also furnished a supply of gas for the same purpose. The usual proximity of the by-product coke oven plant to the open-hearth plant supplies a very good opportunity of utilizing both coke oven gas and tar as open-hearth fuel to the economic benefit of both plants.

As the production of tar goes hand in hand with the production of gas, the natural development of the use of both these fuels has resulted in the practice of

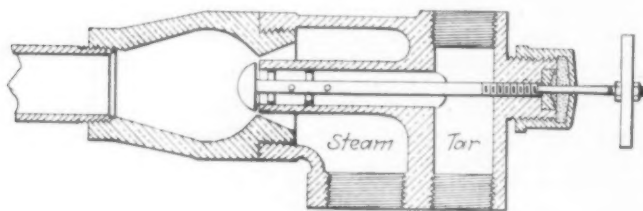


Fig. 2—Krause Burner for Liquid Fuel

using them in combination as fuel for the open-hearth furnace. The use of coal tar only has also been advantageously developed. As tar can be burned more advantageously where high temperatures are required, its use in steel plants has been chiefly confined to open-hearth practice.

Tar has a thermal capacity of about 155,000 to 162,000 B.t.u. per gal. Coke oven gas as used is debenzolated and has a thermal capacity averaging 540 B.t.u. per cu. ft.

Many types of furnaces for metallurgical use have been equipped for use of liquid fuels. As far as the supply of air for combustion with liquid fuel is concerned, these types may be classified into three groups: (1) non-preheating furnaces in which the air is admitted to the combustion chamber at atmospheric temperatures; (2) regenerative furnaces operating on the reversing principle in which the air is preheated in a checker chamber before entering the combustion chamber, the checker chamber deriving its heat from the waste gases; and (3) recuperative furnaces in which the air for combustion is preheated by passing through a set of flues which alternate with flues through which

the hot waste gases flow in a counter direction or at right angles to the direction of flow of the air.

Liquid Fuels in Open-Hearth Furnaces

The price of fuel oils in localities where large tonnages of open-hearth steels are produced is usually so high as to prohibit its use in competition with producer gas. The supply of by-product coke oven coal tar, however, ranging in quantity with different kinds of coal from approximately five to thirteen gal. per ton of coal used, is available in sufficient quantities and at prices which make its use economically attractive, as far as the supply lasts, for use either alone or in combination with coke oven gas in open-hearth furnaces. Where the open-hearth practice has been developed for the use of tar alone or in combination with coke oven gas with consequent closing down of the gas producers, fuel oil may be substituted for tar to permit continuous furnace operations if the regular supply of coal tar is interrupted for short periods of time. As the equipment necessary for using tar is similar to that used for oil, such a change may be quickly accomplished.

[The installations for handling liquid fuels are discussed by the author here.]

As tar is more difficult to atomize than even the



Fig. 3—Combination Water-Cooled Tar and Coke-Oven Gas Burner

heavier fuel oils, the type of burner used is worthy of considerable attention. The most common type of burner used for atomizing tar is illustrated in Fig. 1, where the tar is introduced through a central nozzle with the steam chamber entirely surrounding it. With burners of this type, various alterations of design have been tried with the idea of increasing the efficiency of atomization by inserting a valve spindle through the tar supply pipe, and attaching a ball or cone to the spindle at the fuel orifice. The ball or cone diverts the tar directly into the path of the steam, giving better opportunity for atomization. Another modification of this burner may be obtained by plugging the end of the nozzle and drilling holes at various points throughout its circumference through which the liquid fuel is forced into the path of the steam.

Fig. 2 illustrates a burner, designed and patented by Mr. Krause of the South Chicago plant of the Illinois Steel Co., intended primarily for increasing the efficiency of atomization when burning tar. Its construction lends itself readily, however, to the application of atomizing fuel oils with great efficiency. It is quite simple in design, but very effective in atomizing tar.

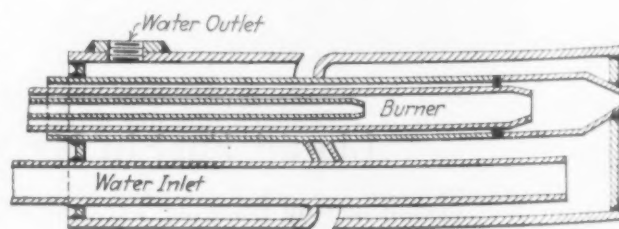


Fig. 4—Water-Jacketed Liquid Fuel Burner

The tar supply passes through the central part of the valve to the button at the end of the valve stem, where it is sprayed in fan shape into the path of the steam. Small projections from the valve stem to the wall of the valve prevent vibrations. The steam chamber is conical in the direction of the tar outlet so that maximum velocity is obtained at the area of contact between the tar and oil. The atomization of the tar accomplished in this burner proves very effectual as judged by combustion conditions within the furnace. The

burner also has the advantage of being quickly cleaned by screwing the valve stem in or out if clogging occurs at the tar orifice.

The steam pressure on the line supplying steam for atomization varies from 50 to 125 lb. per sq. in., dependent on furnaces and burner construction. Likewise, the amount of steam per gallon of oil atomized varies from about 3 to 6 lb. Dry steam is essential for good atomization, steam separators being used where necessary at advantageous positions on the line to obtain this condition. While the amount of steam seems relatively small, it is an item which should not be neglected in determining the type of burner to be used. Compressed air has not proved satisfactory for the atomization of tar. As fuel oils can be atomized with compressed air, however, tests have been conducted at an open-hearth plant using fuel oil only to determine whether steam or compressed air was cheaper. Such tests showed a net saving of seven per cent in the amount of fuel oil consumed in favor of compressed air, using a type of burner found to give consistently good results in furnace operation.

With the temperature conditions existing on the ends of an open-hearth furnace, it is necessary to provide some means of preventing the burner from being destroyed. This may be accomplished by providing mechanical means of swinging the burner out of the furnace when not in use; by placing the burner within a water jacket; or by building a tunnel, which may or may not be water jacketed into the end of the furnace. As the majority of open-hearth furnaces on which liquid fuels are now used were designed primarily for the use of producer gas, there is commonly not sufficient space between furnaces to permit of the use of swinging burners.

In cases where tar is to be used in combination with coke oven gas and the introduction of both fuels has been found to give the best results when admitted into the end of the furnace, the gas burner and tar burner are combined in the same water jacket as illustrated in Fig. 3. Coke oven gas, due to being very light, is always introduced under the tar or oil, the heavier liquid fuel acting as a blanket to keep the lighter gas from rising and burning at the roof of the furnace with consequent short life of the furnace roof. The objection to using a burner of this type is that the tar and steam both must pass through a long atomizing chamber surrounded with water. The cooling effect of the water tends toward both condensation of the steam and the liquifaction of the tar. The shape of the gas tip used with the combination coke oven gas and tar burners is either round or flattened. As the details of furnace construction vary, it will be necessary to determine by experiment whether the coke oven gas will give better results with either the round or flattened nozzle.

With furnaces designed for introducing tar alone at the ends of the furnace, a water jacketed burner similar to that illustrated in Fig. 4 may be used. This

type of burner does not possess the objectionable feature of bringing the burner chamber in direct contact with the cooling water. A similarly designed water jacket may also be used in connection with the combination tar and coke oven gas burner.

The location of the burner in the furnace for either tar or fuel oil is of great importance, and in practice differs as to the height above and angle which it makes with the bath line and the length introduced into the furnace. It should be placed so that luminosity is obtained as soon as the fuel reaches the furnace hearth. In connection with this, it is important that the burner be so placed and the port ends so constructed that proper direction of atomized fuel and air for combustion will give the most efficient melting down and prevent melting of the roof. As different types of burners vary in the thoroughness of atomization, the type of burner used will have some bearing on its location.

The use of a satisfactory quality of liquid fuel alone requires little or no changes in open-hearth practice. It has been used with furnaces up to 200 tons capacity. The quantity of fuel consumed per ton of ingots produced will, however, vary according to the open-hearth practice used at different localities. Furnaces operating with a combination coal tar and coke oven gas practice use variable percentages of each dependent on local conditions. Commonly, however, about 50 per cent of the heat required is derived from each source. Some plants have experienced a reduction of 10 to 15 per cent in the time of heats under similar conditions and a reduction in furnace repairs, as compared with furnaces operating with producer gas. Where waste heat boilers are installed, the less volume of gases from liquid fuel burning, as compared with furnaces operating with producer gas, results in a less amount of heat available for use in the boilers. Application of liquid fuel to heat treatment of wire products is discussed by the author at this point.

Conclusions

Liquid fuels when available at satisfactory prices may be adapted to a large variety of furnaces used in conducting metallurgical operations. The relatively small initial expenditure required for its application and the ease of manipulation of furnace temperatures make the use of liquid fuels quite attractive. Success in using this type of fuel depends on furnace design, proper methods for its distribution to the furnace, and on burners which will thoroughly atomize the fuel. In the future development of the use of liquid fuel for metallurgical furnaces, there are at least two important principles to consider in an effort to obtain further economy. One of these is the adoption of the principle of mechanical injection now used quite extensively with boilers, and the other, the use of the recuperative principle wherever it can properly be applied in the construction of furnaces which now obtain their air for combustion at atmospheric temperatures.

RAIL MAKERS WIN

Interstate Commerce Commission Sustains Protest as to Canadian Shipments

WASHINGTON, Oct. 31.—Producers of steel rails and cross ties in Maryland, Pennsylvania and West Virginia, have been victorious in their protest against the proposal of American and Canadian railroads to make sharp increases on those products when shipped from their mills to points in eastern Canada. In a decision made Oct. 26 and handed down last Saturday, the Interstate Commerce Commission found that the proposed increases were not justified and ordered on or before Nov. 27, the cancellation of suspended schedules carrying the higher rates, which had been filed to become effective July 1 and July 12, 1922. It was proposed by the carriers to cancel their joint commodity rates on steel rails and cross ties in carloads and to apply what really would be rates slightly less than sixth class. The

railroads proposed to apply the class basis for 2000 pounds (net ton) to the gross ton, or 2240 pounds.

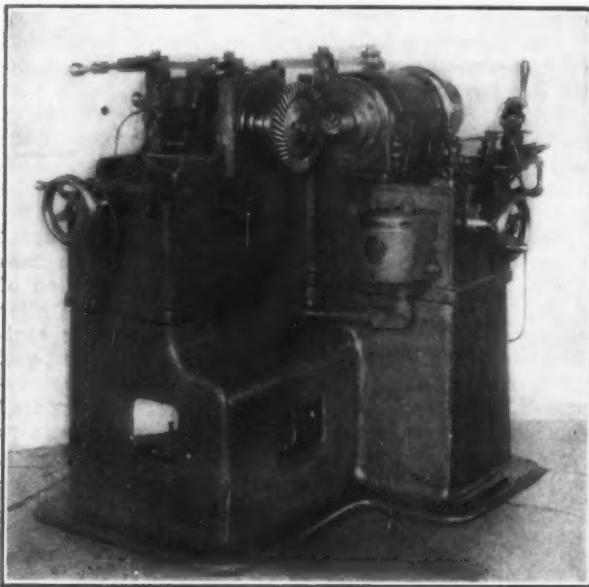
The protest against the operation of the schedules was made by the Cambria Steel Co., the Carnegie Steel Co., the Lorain Steel Co., the United States Steel Products Co., and the National Tube Co., also appeared at the hearing to protest against the schedules going into effect and they were suspended until Nov. 28. Among the contentions made in the protest was that the long existence of the commodity rates applying on rails from the points of origin to the points of destination raised a presumption that the existing rates are reasonable. The protestants were also apprehensive that the application of the proposed rates from Johnstown, and Bessemer, Pa., would make it impossible for them to compete with Canadian rail producers. It was further maintained that it would place them at unfair advantage with steel rail mills in England.

The principal producing points involved in the proceeding were Bessemer, Johnstown, and Steelton, Pa., and Sparrows Point, Md.

Spiral Bevel Gear Testing Machine

A gear tester for spiral bevel gears, and for tests covering the bearing on the teeth, quiet running, and the center distance at which they run with the best bearing and the least noise, has been placed on the market by the Davenport Machine Tool Co., Inc., Rochester.

The construction of the machine may be noted from the accompanying illustration. Both headstocks holding the gears have large bearing surfaces on the bed and a deep dovetail slot with a taper gib the entire length of the slide. Provision is made for clamping the headstock to the bed by means of bolts passing through the headstock into blocks and T-slots in the bed. These bolts are placed very close to the bearing with the intention of making the headstock and the bed practi-



Spiral Gear Testing Machine. The crown gear is mounted on the left-hand headstock and the pinion or gear on right-hand headstock. The three valves shown at the front are used for clamping work in the spindle, moving the slide, and clamping the headstock.

cally one piece during the test. Little adjustment is usually necessary on the left-hand headstock, on which the crown gear is mounted, and it is clamped down by a lever attached to one of the hold-down bolts with an adjustable connection to the second bolt to assure equal tightening of both at the same time.

The right-hand headstock is moved quite a distance each time a pinion or gear is changed for testing and it is quickly operated by means of air pressure. A cylinder mounted on the back side of the machine moves the slide a fixed distance, and after the slide has been drawn back and the pinion changed, a new pinion is brought into mesh with the crown gear in exactly the same position at which the previous one was tested, or to any other position desired. This mechanism is controlled by a hand wheel with a graduated dial, which is located underneath the right-hand headstock. Being moved many times a day, provision has been made for clamping the right-hand headstock by means of an air cylinder. There is also an air chuck fitted to the machine for quickly clamping the pinions.

The three valves shown at the front of the machine are used for clamping the work in the spindle; moving the slide so that the pinion and gear mesh, and clamping the headstock. Reversing the handles unclamps the headstock, moves the slide back and releases the pinion.

Both spindles are equipped with large ball bearings on each end. An arrangement for keeping the oil in the bearings at a constant height has been included. A 3-hp. motor is employed and is mounted in the base. It is controlled by a switch, which permits the spindles to be driven in either direction. The air cylinder exhaust, which is piped to the brake band on the crown gear headstock, cools the brake. If preferred, however,

water may be circulated to the brake for that purpose.

The capacity of the machine is sufficient to cover the range of all sizes of spiral bevel gears used in motor cars. The floor space occupied is about 4 ft. square and the weight about 1500 lb. net.

Baltimore Plant Burns—Plans to Resume Operations Quickly Made

The Baltimore plant of the Porcelain Enamel & Mfg. Co., Eighth and O'Donnell streets, Baltimore, Md., was almost totally destroyed by fire shortly before seven o'clock on the morning of Oct. 23, the estimated loss being upward of \$300,000. The plant adjoins a property of the Standard Oil Co., employers of which laid 15 lines of hose and succeeded in saving a small portion of the enameling plant, as well as protecting the oil company's property.

Heinrich Turk, president of the Porcelain Enamel & Mfg. Co., is in Europe. News of the fire was cabled to him by his brother, Karl Turk, vice-president, and he replied that he would return at once.

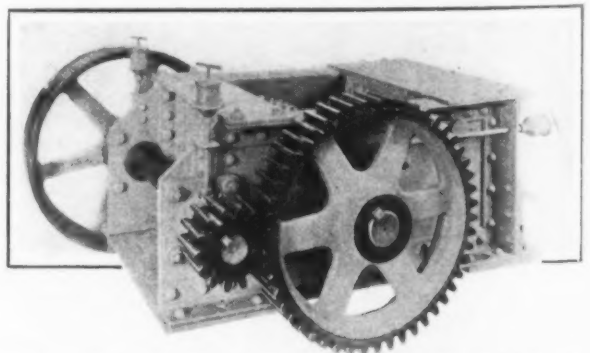
Within a few hours after the fire, plans were under way for the erection of a temporary structure on the site of the buildings destroyed to permit operations that would enable the company's other two plants to carry on their work without interruption. Other enameling companies in Baltimore proffered their assistance to the company. The latter was enjoying one of the best months in its history, and at the time of the fire night forces were working in some departments. The company is the owner of the Pemco enameling process and manufactures enamels bearing the same name.

Improves Single Roll Coal Crusher

An improved single roll coal crusher having a frame fabricated from slab steel plates, a steel shear pin safety device and powerful relief springs, as protection against heavy tramp iron, has been added to the line of the Pennsylvania Crusher Co., Philadelphia. This equipment is for preparing coal for pulverizing, gas making and for stoking.

The new machine is available in the 18 by 18 in. and the 18 by 24 in. sizes, one of the units being shown in the illustration. The steel side plates are 1 in. thick and are connected by nine steel cross members, all heavily hot riveted into a rigid box frame. Bronze-bushed bearings are shouldered into the side plates so that the bearing bolts are not subjected to shear.

The flywheel pulley, which drives the roll through cut back gearing, is provided with a shear pin safety



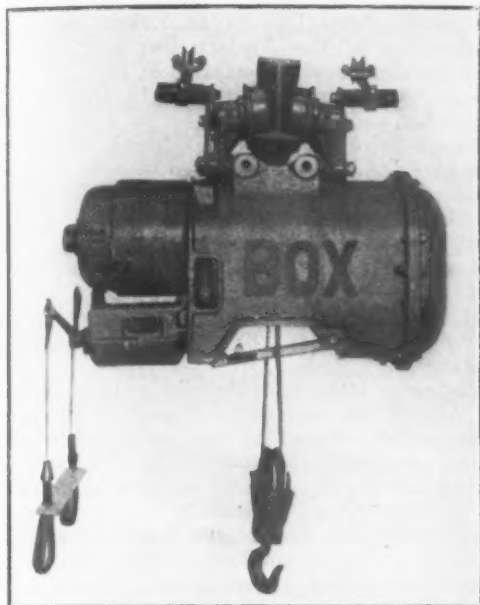
Single Roll Crusher with Frame of Slab Steel Plate. A steel shear pin safety device and powerful relief springs for protection against tramp iron are features

device, mounting a steel bolt in hardened bushings, intended to assure full protection of the crusher parts against tramp iron. The breaker plate is a massive casting of charcoal iron, deeply chilled on the crushing surface. It is hinged on the frame at the upper end, and suspended at the lower end by relief springs. The breaker plate tip, which takes most of the wear, is a reversible and renewable casting of manganese steel. The segmental roll is cast from charcoal iron, deeply chilled, or from chrome steel. Lubrication is by large grease cups.

NEW SMALL ELECTRIC HOIST

Automatic Lubrication—Interchangeable Trolley and Hook Suspension—Simplicity a Feature

The Load Lifter, an electric hoist 11 in. wide and 28 in. long, shown in the accompanying illustration, has been brought out by Alfred Box & Co., Inc., Philadelphia. It is built in one frame only and rated to lift 1000 lb. on a two-part line at 20 ft. per min., or 500 lb. on a single-part line at 40 ft. per min. The rope drum



The Hoist May Be Hung Either Parallel with or at Right Angles to the I-Beam. Interchangeable hook suspension and automatic lubrication are features

of the standard machine will accommodate approximately 80 ft. of rope.

Although small in size the new machine is said to retain the standard construction details of the company's heavier equipment and to be for hard, continuous service. It is further said to have been designed with a view to making the machine so simple and requiring so little expert attention that it could be used safely by anyone.

Automatic lubrication from one point and by a combination of the splash and forced-feed system is a feature. One filling is adequate for about six months. The mechanism is entirely inclosed, all parts operating in oil-tight dust-proof cases, the motor and controller being also inclosed.

The trolleys are adjustable to run on standard I-beams from 5 to 9 in. The hoist frame is arranged to permit mounting of the trolleys so that the hoist will hang either parallel with, or at right angles to, the I-beam. Changing from one to the other is conveniently accomplished by means of a wrench only. The hoist is arranged also for hook suspension, this change being made also without employing any tool than a wrench.

The controller is of special design. It is of the drum type, has non-arcing fingers and is insulated with Bakelite. The cover is hinged to facilitate opening for inspection, and a "water shed" is provided over the feed force. To facilitate wiring a terminal block is built in the controller.

All bearings are equipped with Hyatt flexible roller bearings, except in the motor bearing, and an SKF flexible self-aligning ball bearing is used in the motor. Bearings are permanently aligned, being integral with the hoist frame. The latter is a heavy one-piece casting.

Gears are of forged steel and heat treated. Stub-tooth spur gears are employed, and shafts are of manganese steel. The hoist is equipped with a multiple-disk

roller ratchet load brake, and a band brake on the motor shaft. Stud or tap bolts are not used on the machine. All bolts are fitted through bolts with lock washers.

Cost of Living Reduced

Monthly figures of the Bureau of Labor statistics show a slight reduction in the wholesale prices of all commodities in September as compared with August, the index figure being 153 in place of 155, both being referred to 100 as the average for 1913. The figure is, however, 2 per cent above the 150 recorded in June.

Metals and metal products showed an increase during the month, going from 126 to 134. Building materials, advancing from 172 to 180, while showing the same numerical gain had a lower percentage gain. There were slight increases in farm products, cloths and clothing, chemicals and drugs and the miscellaneous items. All of these, however, were more than offset by the 10 per cent reduction in fuel and lighting. Metals and metal products stand now at 34 per cent above the 1913 average. The other seven specific groups of materials stand at an average of 68 per cent above their 1913 figure, or just twice as far removed from the pre-war prices as metals.

Our table shows the figures for the two most recent months and for September, 1921. It also shows the peak figure of 1920 and the present status of net liquidation, from the peak, of the excess of the peak prices over the average of 1913.

Index Numbers of Wholesale Prices, by Groups of Commodities

(1913 equals 100)

	1920 Peak	1921 Sept.	1922 Aug.	1922 Sept.	Liquidation, Per Cent
Farm products	247	124	131	133	77.5
Food, etc.	248	142	138	138	74.3
Cloths and clothing	346	178	181	183	66.3
Fuel and lighting	281	181	271	244	20.4
Metals and metal products	203	116	126	134	67.0
Building materials	300	156	172	180	60.0
Chemicals and drugs	213	131	122	124	78.8
House - furnishings goods	275	179	173	173	58.3
Miscellaneous	208	118	115	116	85.2
All commodities	247	141	155	153	63.9

Figures of the National Industrial Conference Board, based on the budget of the average wage earning family, show a slight upward turn in September, the cost of living being placed at 55.6 per cent above July, 1914, in place of 54.5 per cent excess in August. Both may be compared with 104.5 per cent excess in July, 1920, which was the peak month. Food is the lowest item in the workman's budget, being now 40 per cent above the pre-war figure. Shelter is 65 per cent up; clothing 55 per cent; fuel and light 87 per cent and sundries 72 per cent.

No drop in prices to the pre-war level may be expected within the next ten years, according to the Harvard Economic Service, the chairman of which has stated:

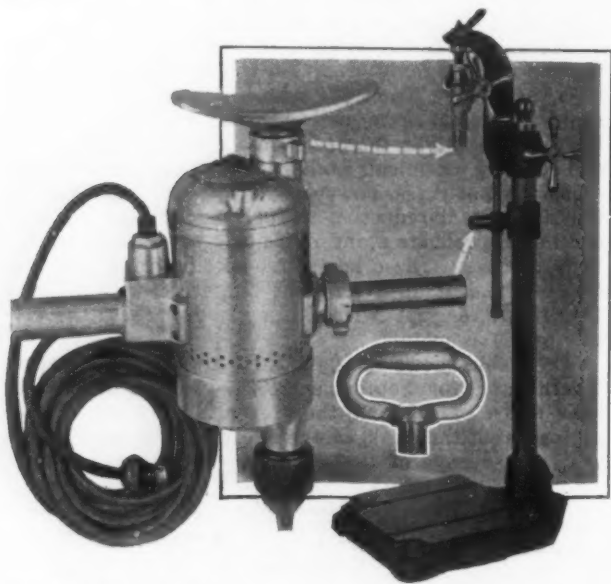
"The plausible inference that prices must return to a pre-war normal has been drawn from the fact that prices have reverted to their former levels after previous periods of currency inflation. The committee, however, cannot find that the governing conditions exist to-day which brought about those lower price levels in the past. If we are prepared to accept, as apparently we must, the present price level as substantially that around which fluctuations of the business cycle must play during the coming decade, we can contribute powerfully to financial stability throughout the world."

The Standard Tank Car Co. will repair 92 locomotive boilers for the Erie Railroad and will furnish 500 underframes for the Atlantic Coast Line Railway.

Portable Electric Drill Convertible Into Bench Drill

The illustration shows the Way portable electric drill built by A. F. Way Co., Inc., Hartford, Conn., which was mentioned briefly in THE IRON AGE as one of the exhibits in Mason Laboratory, Yale University, Sept. 21-23. As indicated, the portable electric machine is convertible into a bench type drilling machine.

The motor employed in this drill is built for the company by the General Electric Co. It is of the universal type and can be operated from the ordinary electric



Portable Electric Drill and Stand to Convert It into Bench Drill with Screw Feed

lamp socket. The bearings of the motor are sealed against oil leakage so that each oiling will last for months. The motor and all working parts are inclosed in aluminum housing, with provision made for cooling. Gears are heat treated and their studs run in bronze bearings at each end. Ball bearings are used only for spindle end thrust.

The breast plate and spade handle can be used as desired. The auxiliary handle bracket may be removed to make close up drilling possible. The electric cable is attached to the machine in a manner to make it impossible to pull it out. In fact, it will support considerably more than the weight of the machine itself. It is claimed that the machine can be taken apart and reassembled in about 15 min. and that it is impossible to assemble it incorrectly.

The use of the drilling stand converts the machine into a bench drill with a screw feed. This screw feed can also be used on the machine without the stand.

Negotiations for Columbia Steel Co.

Negotiations are under way for the sale of the Columbia Steel Co., Elyria, Ohio, which operates a long established cold-rolled strip steel plant, to a group of investors including a number of Pittsburgh men. A new company has been organized under the same name, but will have an Ohio charter, and this will take over the plant, provided the sale is effected. It is expected that the deal will be closed within the next few days.

In the new organization C. E. Lozier, vice-president and general manager of the present company, will be chairman of the board of directors. Officers will include H. M. Naugle, president; K. R. Jenson, secretary and treasurer, and A. J. Townsend, vice-president in charge of operations. Mr. Naugle and Mr. Townsend recently severed their connections with the Central Steel Co., Massillon, Ohio, to become associated with the new Columbia company. Mr. Naugle was third vice-president of the Central Steel Co., in charge of the National Pressed Steel division, and Mr. Townsend was manager of methods and standards. Mr. Jenson has also been associated with the same company.

The board of directors will be composed of the officers named and several Pittsburgh and Elyria business men.

The financing of the company provides for an issue of \$750,000 7 per cent sinking fund gold bonds, \$750,000 of 7 per cent cumulative preferred stock, of which \$500,000 is to be issued and 30,000 shares of no par common stock. The financial part of the transaction is being handled by J. H. Holmes & Co., investment bankers, Pittsburgh.

Wages of Puddlers and Finishers Advanced

Puddlers will be paid \$10.12 per ton in November and December as a result of the bi-monthly examination of sales sheets Oct. 27 at Youngstown between representatives of the Western Bar Iron Association and the Amalgamated Association of Iron, Steel & Tin Workers. This is an advance of \$1.19, from \$8.93 paid in September and October.

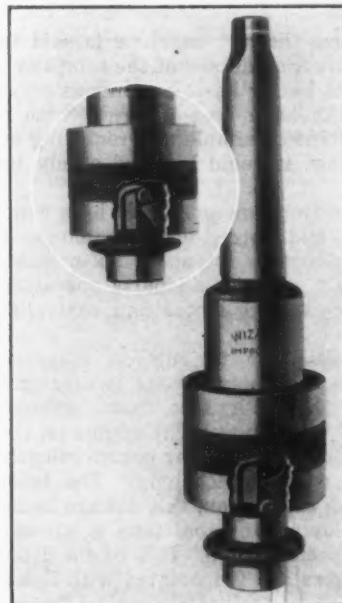
Average price of bar iron shipped during the 60 days ending Oct. 20 was disclosed at 1.95c. per lb., an increase of five points from the average revealed two months before of 1.70c.

Finishers receive an increase in tonnage rates of 12 per cent on the base, or an actual advance of 13 1/3 per cent on the September-October rates. They will be paid 44 1/2 per cent above base under the new rates, as compared with 33 1/2 per cent above base during the past two months.

With some interests subscribing to the Amalgamated Association agreement, shipments declined during the period covered by the settlement, compared with the previous two-month period. Herbert Reese of Pittsburgh, vice-president of the Amalgamated, acted for employees, assisted by a committee, while James H. Nutt, secretary of the Western Bar Iron Association, represented employers. Mr. Nutt estimates that 25,000 workers are directly and indirectly affected by the settlement.

New Quick-Change Drill Chuck

An improved Wizard quick-change drill chuck, constructed as shown in the illustration, has been placed on the market by the McCrosky Tool Corporation, Meadville, Pa. Unusual ease of operation is a feature emphasized.



Drill Chuck Broken Away to Show Mechanism of Driving Member. The insert shows collet locked in place and the full view, the collet entering

The chuck is made up of only two main parts, a driving body with a Morse taper shank to fit the drill press spindle and a slotted collar to hold the collet up in the driving body. The collar is straight and uniform, and is hardened all over. In the improved chuck the bayonet locking slots in the collar, that admit the driving lugs of the collet, are designed to permit inserting or releasing the collet with one hand, without slowing or stopping the machine.

To insert a tool the operator needs only to push the collet into the revolving chuck; the positive automatic latch locks it instantly. A slight pressure of the thumb and forefinger on the knurled collar of the chuck releases the collet and permits it to drop into the operator's hand. The improved chuck will take all styles and sizes of the company's wizard collets.

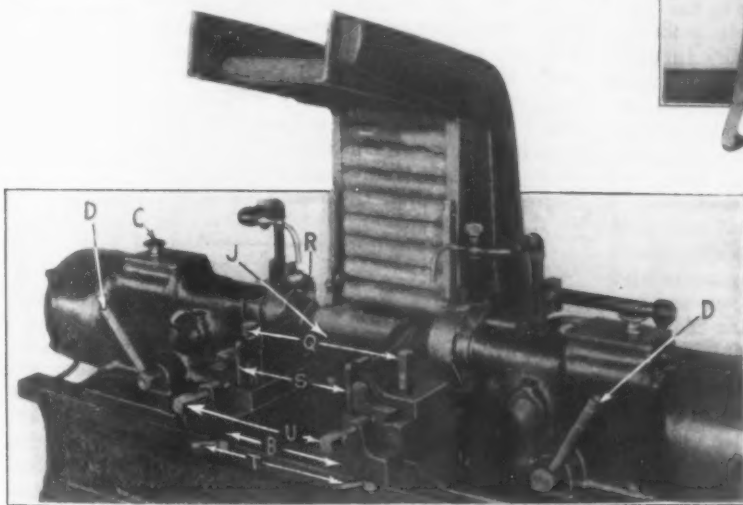
AUTOMATIC CENTERING

Large Production Machine Centers Both Ends in One Operation—Automatic Drill Feed—Other Features

An automatic centering machine having two heads which center the work at both ends in one operation and having also an automatic drill feed mechanism operated in conjunction with a magazine, has been brought out by the Pratt & Whitney Co., Hartford. Clamping of the work is also done mechanically.

The new machine shown in the accompanying illustrations is intended for use in large production work. In operating, after the set-up, it is only necessary to keep the magazine supplied with work and take away the finished pieces. Work is removed from the magazine by transfer slides, placed in the vise, clamped, centered and then released into the work box, independent of attention from the operator. The capacity is for work of $\frac{1}{4}$ to $1\frac{1}{2}$ in. in diameter, and $2\frac{1}{2}$ to 18 in. in length, centering both ends. The floor space occupied is $4\frac{1}{2}$ ft. by $2\frac{1}{2}$ ft., and the weight, with complete equipment, 1020 lb. net.

The automatic feed of the drill heads is operated by the same cam that operates the transfer slides shown at O in the illustration. The small motor at the right drives the cam, and change gears permit adjusting the drilling time to suit the nature of the work. The drills are automatically withdrawn twice during the centering operation, which permits clearing them of chips and allowing oil to enter the drilled hole.



Each spindle has a maximum feed movement of $\frac{3}{4}$ in. which may be reduced to $\frac{7}{16}$ in., with any variation between. The machine may be run through its cycle of operations by hand to check the set-up, a crank handle fitting the shaft at N, being provided for the purpose.

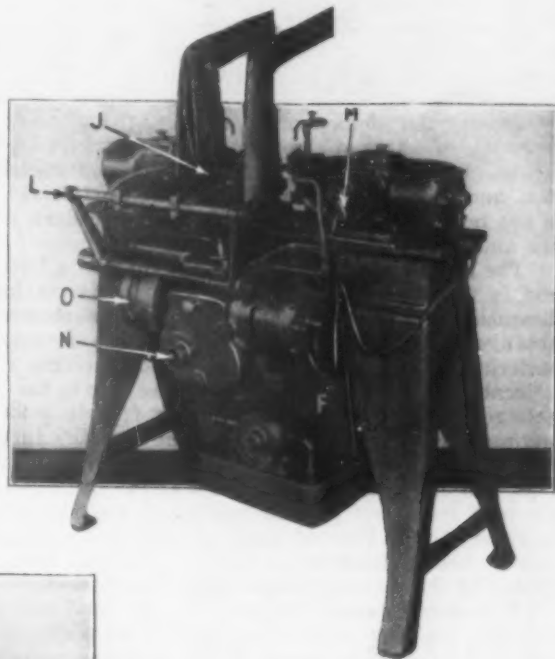
To hold the drilling depth to a desired dimension, adjustable stops are mounted as shown at R in the detail illustration; these bear against the ends of the work to limit the forward movement of the spindles. Where it is required to have the center holes the same distance apart, regardless of variations in the length of work, the stops are positioned to engage lugs on the drill heads, this holding the spindles to a pre-determined forward movement. The drills are driven by individual motors mounted in the head as shown, and geared to provide speeds of 1200 or 1800 r.p.m. The motor drive is made up of three $\frac{1}{4}$ -hp., 1700-r.p.m., constant-speed, alternating or direct-current units.

The changing of gears or locking the spindle for removing the drills is conveniently accomplished by turning the knobs shown at C. The magazine and work supports are mounted on the head castings, the heads merely being moved along the bed to accommodate various lengths of work. The sides of the magazines are slotted and are conveniently adjusted for various diameters of work.

A feature is the self-adjusting vise, shown at B

in the detail view. The work is supported by V-jaws, which are provided with adjusting screws, U, that permit setting the jaws to the desired diameter, the automatic compensating arrangement shown at S taking care of minor variations in the diameter of the work. The work is clamped in the V jaws by transfer plates on the slides, shown at J, which remain in contact during the drilling. Adjustments of the V jaws permit drilling of holes out of center on one or both ends, and facing or chamfering tools may be used in place of drills if desired. The different transfer plates for the various diameters of work are conveniently put in place, four sets of the plates covering the range of the machine.

Oil is supplied to the drills from a geared pump. The tank is located beneath the bed and oil drains into



Automatic Machine for Large Production Centering. The detail view at left shows the location of magazine, vise and other details. The rear view, above, shows cam for operating magazine and automatic feed of drill heads, location of work box, pump, and other parts

it from all parts of the machine, including the work box. The work box, F, is taken off for cleaning and removing the finished work. Work pieces are ejected directly into the box. The box may be removed while the machine is running, a deflector hinged on the bed then being latched in position to catch the work.

Reparation in Pig Iron Case

WASHINGTON, Oct. 31.—The eighth proposed report in the pig iron of Sloss-Sheffield Steel & Iron Co., et al. was made last week when Examiner Warren H. Wagner recommended that the Interstate Commerce Commission make awards of reparation to certain complainants on account of shipments of pig iron from Chattanooga, Tenn., to Ohio River crossings and destinations in Central Freight Association territory. The greatest sum recommended as reparation was \$32,353, which it was said should be paid to the Roane Iron Co. by the Cincinnati, New Orleans & Texas Pacific because of unreasonable rates charged.

The Hummel Steel Foundry Co., Conshohocken, Pa., which was recently incorporated to engage in the manufacture of electric steel castings, has acquired the foundry formerly operated by the Conshohocken Steel Foundry Co., Conshohocken.

Brass Casting and Machining Plant

Equipment and Arrangement of a Foundry in Cleveland—Method of Ventilating Melting Room

THE ventilation of a melting room in a brass foundry has commonly been a trying problem, especially to carry away the fumes resulting from the melting process. This has been met in the new plant of Sterling Brass Co., Cleveland, manufacturer of plumbers brass goods, by natural draft ventilation. Fresh air inlets admit outside air into the furnace room at the floor back of the furnaces and the smoke and fumes from the furnaces pass upward through the top of the building.

Besides the method of ventilation, the plant is interesting in terms of the layout of the various departments. Routing of material to effect economic production, and good lighting facilities, so that artificial light is not needed in the foundry room even on dark days, are among the features.

The plant approaches in plan the form of a letter L and is 197 ft. long and 145 ft. wide in its maximum dimensions. The accompanying floor plan shows the arrangement of the departments and the routing of material. The raw material or scrap receiving room is located at one corner and adjoining this is the furnace room. The foundry proper is 42 ft. 6 in. x 99 ft., having space for 16 molders, and adjoins the furnace room on one side and the machine shop on the opposite side. Adjoining the foundry room at the lower end are the core room and pattern vault. At one end of the machine shop is the tool room and machine shop stock room. Above the machine shop is a second floor, occupied by the plating and polishing department.

A tramrail track equipped with a hand operated conveyer makes a complete circuit of the plant, starting at the outside entrance of the receiving room and extending in a straight line through that room and the furnace room, and making a right angle turn from the furnace room through the center of the foundry, and then through the machine shop, terminating at the shipping door at the side of the finished stock and shipping department that adjoins the lower end of the machine shop. This monorail is used for carrying material to the furnaces, crucibles of molten metal from the furnaces to the foundry door, and rough castings from the foundry to the machine shop. The tramrail was supplied by the Cleveland Crane & Engineering Co.

In the outer wall of the melting room, back of the furnaces at the floor line, are three cold air doors, 24 x 36 in. Outside air enters these doors, is carried around the furnaces and upward, and passes through openings provided by top hung sash under the roof. This being of the inverted monitor type, aids in turning the air currents through the side wall outlets. The sash are in two continuous sections, 4 ft. wide on each side of the melting room and are mechanically operated from the floor. The cold air openings are covered over with mesh on the outside and are further protected with $\frac{3}{4}$ -in. rods on 4-in. centers and on the inside have doors of steel plate construction. The melting room is 23 ft. high to the top of the brick work.

The melting room is equipped with two open flame and two crucible furnaces of the Monarch type, each of 500 lb. capacity. The furnaces are fired with fuel oil which is used also for firing the core oven and for heating the entire plant. The steam heating boiler in the basement is provided with automatic oil regulation. This equipment is used as being economical in that no attendant is required for the heating plant. The oil supply is kept in a 20,000-gal. fuel oil tank located underground outside the building, and is carried to the furnace room in a trench in which the electric conduits are also located. The oil for the furnaces is forced into two 60-gal. auxiliary tanks in the furnace room and from this is delivered to the furnaces at 60 lb. pressure

through an oil line directly beneath the furnaces. By having the auxiliary tanks partly filled with air, an air cushion assures a flow of the oil to the furnaces with a relatively even pressure. Cores are baked in a 6-drawer oven built by the Foundry Equipment Co.

At the end of the foundry room adjoining the machine shop, the castings are cut, cleaned, polished and ground. The rough product is finished and assembled on the first floor. Product that requires more than rough finishing is carried up a specially designed elevator to the plating and polishing rooms on the second floor. This elevator amounts to a $\frac{1}{2}$ -ton Sprague electric hoist which operates an elevating platform in a cage connecting the two floors. It is so arranged that when the operator standing on the floor lets go of the control rope, the elevator stops. The parts are handled from one floor to another on 30 x 36-in. hand trucks, having wooden 6-tier platforms. The same trucks are used for carrying finished product to the shipping door.

The plant is of mill type construction with brick walls. The furnace room is of fireproof construction, of reinforced concrete, with a concrete roof. Wood block floors are used throughout on the first floor. The foundry roof also has an inverted monitor. All windows have steel sash and the foundry has continuous window sections of factory ribbed glass. The entire plant is equipped with a sprinkler system.

The plant was designed by and built under the supervision of Allen Sogg, architect and engineer, Hippodrome Building, Cleveland.

An official announcement is expected to be made soon by the Westinghouse Electric & Mfg. Co., that it has purchased the Sharon, Pa., plant of the Savage Arms Corporation, the purchase including the Sharon Improvement Co., the land and housing company of the Savage Corporation in Sharon. The plant property covers approximately 15 acres, containing a 3-story office building, machine shops for both light and heavy work, and a power plant. It is served by the Pennsylvania, Erie and the New York Central railroads. The Westinghouse company has not yet announced its intentions with regard to the acquired property.

The Minnesota & Ontario Paper Co., International Falls, Minn., has decided to equip each of its 12 326-hp. horizontal return tubular boilers with Westinghouse stokers. The equipment consists of three retorts per boiler with double-dumping ash grates of the new model type. Each two stokers are driven by a Westinghouse vertical reciprocating steam engine. The coal used in this industrial power house is Youghiogheny screenings fired at about 12,000 B.t.u. per lb. An approximate analysis of the coal is fixed carbon 55 per cent; volatile matter 30 per cent; moisture 3 per cent; ash 12 per cent and sulphur 1 per cent.

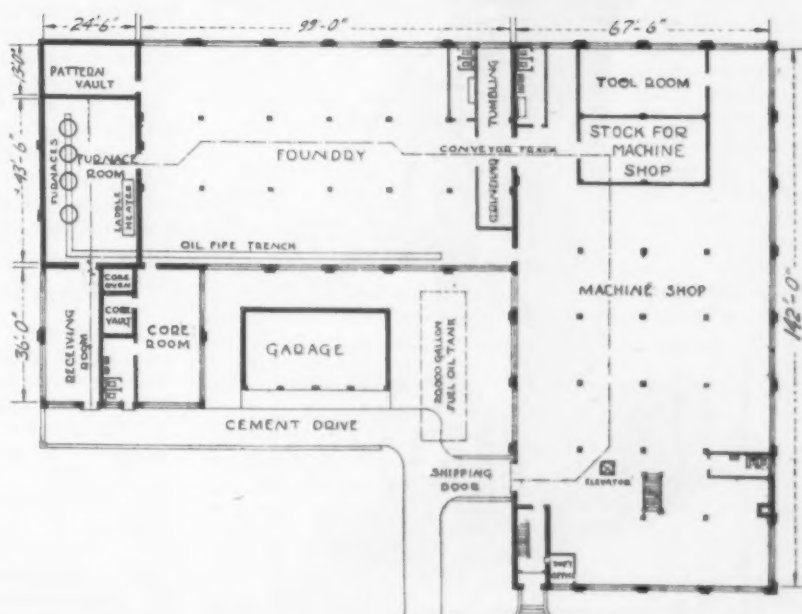
The Standard Tank Car Co., Sharon, Pa., has received an order from the Erie Railroad for 92 locomotive boilers and for 500 underframes from the Atlantic Coast Line Railroad, reports President John Stevenson, Jr. The plant is working three 8-hr. shifts. It is now filling an order for 150 tank cars from a Southwestern oil interest, and has orders on its books approximating \$7,000,000 in value.



Ventilation of the Melting Room of the Sterling Brass Co. (Above) Has Been Solved by Having Fresh Air Inlets in the Wall Back of the Furnaces, Providing a Free Circulation of Air, Which Carries the Fumes from the Furnaces to the Top of the Building and Out Through Side Windows. As the cold air is admitted near the floor, it spreads over the floor and then, on becoming heated, rises to the exits

At Right Is the General Layout of the Plant. A monorail system extends from the raw material receiving room through the melting, foundry and machine departments to the shipping platform

Below Is Shown the Foundry Floor, with the Monorail Running Though the Center. Its method of suspension is of interest



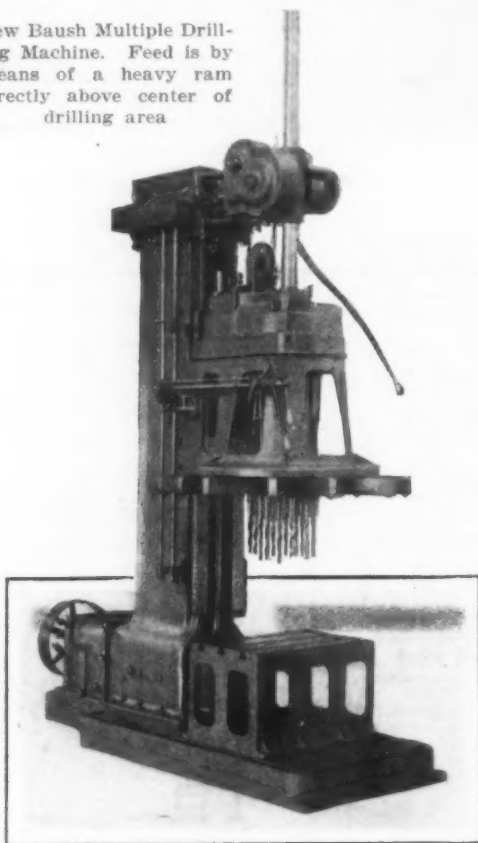
New Multiple Drilling Machine

A high-speed multiple drill, known as the No. 2A, the design of which is founded on the idea of a center-feed type of machine that will apply the feed pressure over the center of the drilling area, has been brought out by the Baush Machine Tool Co., Springfield, Mass.

It is intended in this design to hold a true alignment of spindles, prevent the head from springing under the drilling pressure and to prevent cramping of the head on the ways. In preventing the springing of the head, the friction between the drills and the bushings is largely eliminated. This, in turn, does away with the severe pressure of the drills and connecting spindles, and greatly reduces the strain on the feed mechanism.

The capacity of the machine illustrated is, in cast iron, twelve 1-in. drills or equivalent. There are four

New Baush Multiple Drilling Machine. Feed is by means of a heavy ram directly above center of drilling area



optional methods of drives; by three-speed cone pulley, three-speed change gear box, either belt or motor driven, and by direct connected variable speed motor. The main drive comes through the base directly to the head gears, an arrangement tending to eliminate vibration. Fifteen to 20 hp. are required for operation.

Feed is by means of a heavy ram directly above the center of the drilling area. The ram is moved by a pinion which is connected through the change-feed gear box directly to the main drive of the machine. There are three changes of speed, and for each of these there are three changes of feed, which vary from 0.0018 to 0.023 in. per revolution of the spindle. Other feeds can be provided. Except for counterboring, the head is operated by hand only in emergency and for adjusting tools for height or alignment in gigs. The pilot wheel is disconnected when not in use.

Round and rectangular heads of various sizes can be provided. The patented spindle arm in use on the company's other drills has been retained; these permit liberal vertical adjustment of the spindles and a center distance to be obtained equal to the diameter of the spindles themselves. An automatic safety counterweight catch is provided which prevents falling of the counterweight if the cable breaks.

Ease of operation is emphasized. Quick approach and return of the head is operated by friction clutches in the feed gear box, the head being quickly lowered

or raised by the manipulation of a conveniently placed lever. The head can come down at fast speed until the drill comes in contact with the work, no care being necessary to prevent damage, as when the drills strike the work the friction clutch immediately slips. The power feed is then thrown in and when drilling is finished the head automatically returns at fast speed and stops at the starting position. This feature is built integrally in all machines of this model.

The machine can be built for tapping in addition to drilling, in which case back gears on the head are used for reducing the spindle speed. In operating, the taps are brought down into the work by means of the quick approach. Further downward movement of the head is then controlled by the lead of the taps in the work, and at a certain point the rotation of the taps is automatically reversed. After the taps have cleared themselves from the work, the operator engages the quick return and the head travels up to the starting position and stops, the spindles being automatically reversed ready for the next operation.

A counterboring attachment for spot facing and similar operations is also available. In this the head is advanced slowly and with great power by hand, being accomplished by means of a lever and gears. Back gears in the head for reducing the spindle speed may be used in this connection.

Roller bearings are used for shafts and ball thrust bearings where required. Driving gears are of steel. A hole is provided in the back of the column for adding or removing small weights to nicely adjust the balance of the head. An oil pump and tubing is furnished as required. The floor space occupied is 3 ft. x 8 ft. 10 in., the height with feed ram in extreme position is 12 ft. 3 in. and 10 ft. 8 in. with feed ram down. The distance of the spindles to bed is 45 in. and 20 in., maximum and minimum, and that of the face of the post to center of head is 20 in.

Ferryboat Youngstown Launched

In the presence of a group of Youngstown steel men, the Youngstown, flagship of the Erie ferry fleet in New York harbor, and reputed largest ferryboat in the harbor, was launched Oct. 26. Miss Marie Campbell, daughter of President James A. Campbell of the Youngstown Sheet & Tube Co., christened the boat. It is scheduled for active service by Jan. 15 next. The new Erie flagship will carry 3000 passengers and 40 vehicles. It is 210 ft. long and 45 ft. wide, double deck. The Youngstown delegation traveled to New York as the guests of W. A. Baldwin, manager of the Ohio Region, located at Youngstown. James A. Campbell, Thomas J. Bray, James H. Grose, Fred Tod, James B. Kennedy, Julius Kahn, C. H. Booth, Robert Bentley, W. H. Foster, G. F. Alderdice, Lloyd Booth, E. L. Clark and Paul Hubbard were among those from Youngstown steel companies who witnessed the launching.

A New Stinnes Tube Plant

The new Stinnes tube works, concerning which various reports have come to the United States from Germany, will consist of six units of which it is planned to have the first ready this year. The plant is built with a view to mass production, especially of the larger sized tubes. It is being erected alongside the private railroad line of the Bochumer Verein für Bergbau und Gussstahlfabrikation A. G., which is Stinnes-controlled, and the location is between Bochum and Essen, convenient to the iron and steel works of the Bochumer Verein. The Mannesmann system will be employed in the new mills. The rate of construction of the plant as originally laid out will depend on the general industrial development in Germany, and also on the amount of capital the company has available for extensions. There has been some talk of increasing the share capital of the Bochumer Verein.

The Board of Estimates at Saginaw, Mich., has approved an \$800,000 bond issue for the construction of a consolidated pumping station for the city.

Automobile Production Problems

Machine Tool Selection and Performance and Wage Payment Methods Among Topics Discussed at Meeting Last Week in Detroit

THE first national production meeting of the Society of Automotive Engineers, with an attendance of 300, was held Thursday and Friday, Oct. 26 and 27, at Detroit. The first session was called to order in the general auditorium of the General Motors Building, on Thursday morning. By way of introduction, L. C. Hill, of the society's staff, spoke of the meeting as the culmination of efforts to have the production men get together to discuss "shop problems."

E. Karl Wennerlund, of the General Motors Corporation, presented a paper describing "The Group-Bonus and its Application." The system was evolved in the General Motors plants and was fostered by the desire to eliminate the complicated factory cost systems attending the premium, piece-work and flat wage methods. Mr. Wennerlund enumerated the faults of the individual wage incentive systems, citing the large amount of clerical work involved and traced the various steps from piece work through the coupon or job ticket system to the group bonus plan. This method is especially adapted to progressive manufacturing where the product moves in a line or lines. The three major operations in automobile work are machine work, turning and bench work. Groups working on each operation do the same work and the group is rewarded with a 20 per cent bonus for 100 per cent efficiency, which is the actual number of hours on any one job divided by the total standard hours. Standard hours have been established by taking the average elapsed time on any one operation over a long period. Summarizing:

The group plan is primarily applicable to repetitive work arranged in progressive production lines of sequence operations, but it is also applicable to non-progressive operations where the individual interest can be centered on definite results per man-hour of labor. Like any other wage-incentive plan, it has for its main objective the speeding-up of the production rate per employee; that is, intensive production.

It is being used because it simplifies the factory detail where a high rate of production is desired on repetitive work, and where a wage incentive is employed as the means of obtaining intensive production. Its application has gained favor among factory executives, because it speeds-up production as compared with the individual plan on the same work, ties up less material in process and minimizes clerical detail in the factory.

To have a group plan remain in successful operation over an indefinite period, it is necessary to maintain the interest of the individual worker in the group effort. It must be simple for computation of individual earnings, flexible so as to meet changing factory conditions and easily understood by each group member.

Ford Practice in Using Furnace Metal in Castings

A paper prepared by P. E. Hagland and I. B. Scofield, of the Ford Motor Co., was presented by Mr. Hagland and told an interesting story of the production of Ford cylinder blocks from ore to the finished product. Aided by slides, the facilities of the Ford company were shown, starting with the ore docks and following through the blast furnace, foundry and machine shop. By diagrams Mr. Hagland emphasized the dominant idea in all Ford manufacturing units of progressive manufacturing by mechanical conveyor systems. The author said there had been many erroneous statements made as to their method of using hot metal direct from the blast furnace and stated that the percentage used was 30 per cent by weight of the total melt. The cupola charges contain approximately the same sulphur, phosphorus and manganese content as the blast furnace metal, and any differentiating necessary to give a constant silicon content is done by varying the weights of the metal direct from the blast furnace, but as an aver-

age they were using approximately 30 per cent of the direct furnace iron in their mixture.

Reducing Cost of Perishable Tools and Supplies

A paper prepared by F. A. Mance, of the Studebaker Corporation, Detroit, entitled "The Control of Operating Tool and Supply Cost" was the third feature of the session. The author outlined a system that has been in practice for four years in the Studebaker factories, which covered a control over expenditures for perishable tools and operating supplies, by allotting the amounts to be used by each department for every operation in accordance with the number of cars built. The methods of procedure were given for instituting such a system and for charging off the costs of tools used in one department when the tools are "salvaged" from other departments. This system after four years' trial by the Studebaker Corporation has shown a reduction in the cost of perishable tools of approximately 71 per cent; admitting, of course, that some of this reduction was due to decrease in the cost of the tools.

J. A. Ford, Studebaker Corporation, presented a paper outlining "A New Method of Processing Spline Shafts," devised as a result of a series of experiments. The process eliminates the difficulties incident to the finishing of the splined and body portions of a spline shaft, such as is used in transmission gearing, by grinding with a formed wheel after the shaft has been hardened. The accuracy of the finished shaft was the primary consideration and three other groups of important considerations are stated, as well as four specific difficulties that were expected to appear upon departure from former practice. Illustrations were presented to show the tools used, and the method of using them was commented upon step by step. The shaft can be straightened to within 0.005 in. per foot of being out of parallel with the true axis of the shaft, after the shaft has been hardened, and it is then re-centered true with the spline portion.

Thursday afternoon was spent in a tour of the Ford River Rouge plant and in the evening over 500 members and visiting guests attended a dinner at the Hotel Statler at which Pierre S. du Pont, president General Motors Corporation, was the guest of honor.

The Friday morning session, presided over by H. W. Alden, was introduced by a paper on "Problems Met in the Production of Air Cooled Engines," contributed by William Drink, H. H. Franklin Mfg. Co., Syracuse, N. Y., maker of the Franklin automobile.

Some interesting production troubles in the Packard factory and how most of them were solved by accidental discoveries of the seat of trouble was disclosed in a paper entitled "Experience from a Production Note Book" prepared by H. J. Crain and J. Brodie of the Packard Motor Car Co.

Gear Troubles Discussed

K. L. Hermann, Studebaker Corporation, presented an interesting treatise on "Production Errors in Gears." Summarizing:

The different gear noises are classified under the names of knock, rattle, growl, hum and sing, and these are discussed at some length, examples of defects that cause noise being given and a device for checking tooth spacing being illustrated and described. An instrument for analyzing tooth-forms that produce these different noises is illustrated and described.

Causes of the errors in gears may be in the hardening process, in the cutting machines or in the cutters. A hobbing machine is used as an example and its possibilities for error

are commented upon. Tooth-forms are illustrated and treated briefly, and the hardening of gears and the grinding of gear-tooth forms are given similar attention.

The discussion was in general one of compliment to Mr. Hermann for his thorough research work in developing methods of checking errors correctly. The consensus of opinion was that the automobile industry as a whole was receiving great benefits from such individual experimental work. Mr. Hermann expressed a hope that his offering would be a spur to further efforts along this line.

A. J. Baker, Overland Co., in his paper on "Selection of Machine Tools," urged production men to be certain of their needs before making radical changes in their methods of manufacturing. Citing cases of special

equipment being installed where standard machines would have served the purpose at much less cost, R. K. Mitchell's paper on "Machine Tool Efficiency" dove-tailed into Mr. Baker's statements. The author expressed the opinion that where new equipment is necessary, in most cases there are standard machines on the market to fill the need. He urged a closer study of the possibilities of standard machines on the part of the prospective purchaser.

The meeting closed Friday afternoon with tours of inspection to the Dodge, Packard and Cadillac factories. There is no doubt that the production men of the S. A. E. will have an annual meeting and that hereafter the production section will be a prominent factor in the general S. A. E. meetings.

NEW BOX CAR ORDER

Effect on Iron and Steel Shipments Not Expected to Be Very Important

WASHINGTON, Oct. 31.—Shipments of the more highly finished steel products such as sheets and tin plate are affected more than other steel products by the order of the car service division of the American Railway Association that railroads operating east of Chicago, Peoria and St. Louis, return at once all box cars now on their lines which are owned by carriers in the Northwestern, Central Western and Southwestern districts. The car service division says the order is the most drastic it ever issued and was promulgated for the purpose of aiding in the movement of the tremendous business which is now being offered to the railroads in the West, and to meet the demands of agricultural interests and other shippers for greater transportation facilities. In 1920, orders were issued for the movement of trains of empty freight cars to Western points. That order resulted, however, in many cars being dispatched westward, which were wholly unsuited for the needs of shippers in the West. The order issued on Wednesday of last week limits the movement to those cars belonging to Western railroads, as such cars are particularly adapted to the needs of shippers in that part of the country.

The box car equipment being used by the iron and steel industry is chiefly for the purpose of shipping highly finished products. The order is not expected to have a widespread effect in the trade. The effect, however, will be reflected to some extent not only in certain restrictions in movements directly from the mills. It has been pointed out that there will be a reflection indirectly also. This is due to the fact that consumers of products moving in box cars from the mills even more extensively use box cars in shipping their finished products. With the supply of their rolling stock curtailed, it has been stated, they might be compelled to have shipments from mills deferred. While automobile cars are exempted in that part of the order discontinuing use of box cars for local loading in the territory surrounding Grand Rapids, Detroit, Toledo, Youngstown, Pittsburgh, and Wheeling, as well as of territory east of those points, it is provided that automobile cars must be moved, loaded or empty, in the direction of automobile loading territory. This, it is declared, will make the order less applicable to the sheet industry than it would be if it were not for the exemption as to automobile cars. Shortly after the order was issued, the Car Service Commission says that it was advised that one of the large Eastern railroads began making up two trains of empty cars for movement to the West in compliance with the order. Demand for freight cars in excess of the available current supply amounted to 156,309 on Oct. 15. This was an increase of 15,057 over the total on Oct. 8.

Shortage of Box Cars

The shortage in box cars amounted to 77,111 cars, an increase of 6048 within a week. The shortage in coal cars totaled 44,984 or an increase of 4485 within the same period. A shortage of 18,919 was reported

for stock cars, which was an increase of 1442 since Oct. 8, while there was an increase within the same period of 2840 in the shortage of refrigerator cars which brought the total to 7631 cars. At the same time, 4275 surplus cars of all descriptions and in good repair were reported scattered throughout the country, 1225 less than on Oct. 8. Of that number 1588 were surplus coal cars, a decrease of 1436 within a week.

More Freight Loaded

Loading of revenue freight amounted to 983,470 cars during the week which ended on Oct. 14, according to reports just received from the carriers by the car service division of the American Railway Association. This was an increase of 15,301 cars over the week before. It also was an increase of 72,941 cars over the corresponding week last year, but a decrease of 35,069 cars under the corresponding week in 1920 when loadings were the greatest in the history of American railroads. Except for the Northwestern, every district showed an increase over the week before in the total loading of all commodities, while all except the Pocahontas showed an increase compared with the corresponding week last year. Coke loadings for the week totaled 10,208 cars, a gain of 328 over the previous week. This was an increase of 3909 cars from the same week one year ago, but a decrease of 5570 under the same week in 1920. Ore loadings totaled 46,362 cars, 1077 under the week before, 26,542 above the same week last year and 30,067 below the same week two years ago.

Plate Mill for Scotland

Stewarts & Lloyds Co., Ltd., Mossend, near Glasgow, Scotland, has placed a contract with Mackintosh-Hemphill Co., Pittsburgh, for a 2-high reversing universal plate mill, with all auxiliary equipment. This mill will roll universal plates from 8-in. to 50 in. wide, or sheared plates up to 84 in. The horizontal rolls for the mill are 34 in. in diameter. On account of high costs and freight charges, the mill will be designed in Pittsburgh and built in England from the Mackintosh-Hemphill designs.

Mackintosh-Hemphill Co. now is working on the 40-in. blooming and the 24-in. sheet bar mills, the order for which, with all auxiliary equipment, was placed a few weeks ago by the Otis Steel Co., Cleveland.

Tin Plate Plant Resumes

YOUNGSTOWN, Oct. 31.—The most important change this week in operating schedules of Mahoning Valley iron and steel plants is in the resumption of the Liberty tin plate works at Leavittsburg of the Trumbull Steel Co., following a protracted idleness. This property would have started sooner, except for lack of steel. The Trumbull company is now operating at a rate close to normal in all departments.

The 132-in. plate mill of the Brier Hill Steel Co. is operating only half of the week. Otherwise schedules are unchanged in blast furnaces, open-hearth furnaces, Bessemer departments, sheet, tin plate and tube mills.

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ESTABLISHED 1855

THE IRON AGE

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One Gage of Future Demand

Assuming that the state of activity of a number of large steel consumers will be sooner or later that of all other such industries, a gage may be taken of the steel demand of the near future. The immediate past in building and construction work, in automobile manufacture, in railroad purchases and in farmer buying is known. These four broad classifications may be regarded as absorbing one-half of all the steel made.

Activities in the building and automobile fields have been at so high a rate that one can hardly count on a further expansion. He is likely instead to be satisfied with an approach to what has obtained in the past several months. The steady flow of railroad business this year may keep up, as it should, considering the admittedly great needs; even if steel buying for railroads is not at the current rate, it will probably be larger than those close to railroad financial problems believe possible. The farmer as a steel consumer will be a factor in the months just ahead, for the reason that he has been absent from the market for all of a year and one-half and must buy for much the same reasons that the railroads have had to buy. No great volume of steel seems likely to go to the farmer because the purchasing power of his crops is still out of line and has not been greatly helped by the recent betterment in his prices and the movement of farm products.

On the whole, the indications in respect to the industries taking close to one-half of the country's steel are for a smaller rather than a larger demand than has marked recent months, and if the remainder of the steel business moves in unison with the groups mentioned, then we shall do well if we maintain the present scale of business for the next five months. Beyond that, the factors of uncertainty increase, seeing that April 1 brings us face to face with another coal strike with all its possibilities of unsettlement, and with little of the chance for fuel accumulation of which industry availed itself in the first quarter of 1922.

For the first time, China's imports of American copper were given separately in the July statistics and now that the August figures have been pub-

lished, China's takings of our copper are shown to have been 20,000 net tons in the first eight months of the year. This is 1000 tons more than was taken in the same period by Japan, large customer as that country has been known to be. Heretofore the direct shipments to China have been included under the head of "other countries," and there was also a considerable sale to China of American copper that had been imported by Japan. Japan's new tariff on copper has naturally cut off importations to that country for reshipment to China. The statistics show another interesting fact: The total of refined copper exports has been lately at the highest rate since the war. At an average of 28,950 tons per month up to Sept. 1 this year's movement has far exceeded the rate in 1919, 1920 or 1921. And Germany still maintains the lead among buyers at over one-third of the total, despite the sensational fall in the mark. Yet in spite of growing consumption abroad and at home, there has been no such change in the relation of supply and demand as to give a real upturn to the copper market. As with steel, the day of any substantial profit is still deferred.

A Real Manganese Ore Survey

It has been quite evident from the attitude of the steel industry toward the duties on manganese that this feature of the new tariff act would soon be brought to the attention of the Tariff Commission with a view to its revision. Opportunely the War Department just now is making its inquiry as to the country's resources in minerals of particular strategic value in times of war. Thus the question comes up afresh as to the available tonnage of high-grade manganese ore in the United States.

The possibilities of manganese mining in this country were put before the framers of the Fordney tariff act in a very different light from that in which the domestic users of ferromanganese long have viewed them. Members of the Ways and Means Committee apparently were led to believe that in view of the amount of manganese ore produced at home in one year in response to the war time demand and to a price range of \$250 to

\$450 in 1917 and 1918, we have a potential industry which could be stimulated by proper protection. We have already expressed the view that as the amount of high-grade manganese ore in the United States is small, our resources of that sort ought to be kept in reserve against the day, should it ever come, when war conditions on the high seas would make it difficult or even impossible to import manganese from our usual sources of supply. That view was reinforced by the conservative estimates made by the U. S. Geological Survey, whose means for obtaining reliable data are of the best. On the other hand, were the enormously higher estimates of native manganese ores (unsupported by impartial authority) put before the tariff makers by the American Mining Congress. These estimates seem to have carried the day.

Elsewhere in this issue is a statement from the joint committee of the American Institute of Mining and Metallurgical Engineers and the Mining and Metallurgical Society of America, which has set out to supply the War Department with entirely fresh data concerning the manganese reserves in the United States. The committee is composed of fair and able men. It asks the help of all who have information concerning deposits of manganese ores and of manganiferous iron ores. The latter are of considerable extent, as is well known, but they cannot be made the basis of a domestic ferromanganese industry, Congress to the contrary notwithstanding.

What is needed now is such an impartial survey of the whole question as shall become the basis of a new canvass of the tariff on manganese ore and ferromanganese. The inquiry should have the fullest co-operation of all interested in knowing the exact facts concerning manganese ores in the United States and the policy of taxing American steel consumers for their development.

Two Institute Speeches

Two noteworthy addresses were made last Friday evening at the banquet of the American Iron and Steel Institute by Admiral Vogelgesang and Attorney Dwight W. Morrow. The admiral spoke with much force and with careful selection of words in making a plea for a strong navy, and no one in the steel industry will dispute his claim that the Navy has been a powerful influence in improving the quality of steel and in hastening the substitution of steel for wrought iron. Certainly the Navy has played no small part in the development of the steel industry. It was unfortunate, however, that the admiral, in his zeal for a strong Navy, spoke rather slightly of the Washington conference for limitation of armament, giving the impression that its influence has been mischievous in encouraging "fanatical pacifists." It was also unfortunate that the admiral described war as a necessary accompaniment of progress. This is not in keeping with the advanced thought of to-day and many in the steel industry will not concur in it. They will rather agree with what Secretary Hughes said at Boston Monday night in regard to the conference:

This was far more than a limitation of naval arma-

ment; it was the rescue of the world from despair. And however serious the difficulties that vex us at the moment and may continue to vex us for some time to come, the work of the Washington Conference, with the assurance of the sincerity of the desire for peace, lights the pathway of hope for a world that is weary of war.

That kind of a conference does not weaken the "backbone of the nation" or breed "fanatical pacifists," as contended by the admiral.

One of the brightest chapters in the history of the great war is the record made by the steel industry in furnishing all sorts of equipment for the Allies before the United States entered the war, and of giving almost its entire output to the United States and the Allies after the United States became an active participant. There is not a particle of evidence that the leaders of the industry did anything to start the war, or to keep up warfare for the sake of the money they would make out of it.

A bright picture was that painted by Mr. Morrow, who, with clear vision, showed how manufacturers had contributed to the comfort and happiness of mankind. When one hears of quantity production, he is likely to think of driving work, hot plants and grimy faces, but Mr. Morrow brought the view that quantity production has made life more comfortable for millions of people. In the way of illustration, he spoke of sugar, whose production and use with modern methods of refining have increased immensely in the past two hundred years; but, as Mr. Schwab afterwards remarked, steel might have been taken as an illustration, and Mr. Morrow did refer to the great service of steel manufacturers in making useful products. Quantity production becomes a great thing, not only for the increased volume of product it has brought into use, but because of the world-wide distribution and the service to humanity. There is more of the admirable in business than is generally conceived and sometimes one looking upon it from the outside can see the admirable more distinctly and picture it in a more fascinating way than one intimately connected with it. This was the achievement of Mr. Morrow and such preachments as his will always be welcome in meetings of the institute or similar gatherings of manufacturers.

Facing the Labor Issue

With the growing use of applied psychology, there is more common recognition of the fact that men do not always think straight, that sometimes they parade as the product of purely logical thought conclusions that really are reached partly by emotional processes. There is confusion in many subjects of vital public importance by the introduction of emotional factors and by the suppression for emotional reasons of plain facts.

In the trite remarks that the interests of "capital and labor" are identical and that capital and labor should co-operate with each other instead of occupying an antagonistic attitude there is suppression of the plain fact that the interests of buyer and seller in some respects are necessarily antagonistic. In other respects they are

necessarily mutual. The wish being father to the thought, the attempt is made to show that employer and employee should get along together as well as do buyers and sellers of that which is produced. The cases are not identical, and right thinking, unconfused by emotion, would not make them appear so.

As between buyer and seller there are certain things of mutual advantage. The producer wishes to produce good goods, and the consumer wishes him to do so. The producer desires that the consumer thrive, so that the market may be preserved and increase. The consumer desires that the producer thrive, so that his source of supply may continue. The existence and success of each party is essential to the existence and success of the other. Naturally there is co-operation. The producer studies the needs of the consumer and endeavors to meet them. Frequently he anticipates them. The consumer endeavors to use the materials that can be produced with the greatest facility and when he can he will aid the producer to manufacture more economically.

On the other hand, the buying and selling operation involves also a diversity of interests. Whatever the parties may say, each desires to strike the best bargain possible, as to price, quantity and quality. These desires are restrained only by considerations of self-interest.

Between employer and employee there is an opposition of interest that is precisely similar in character, with a restraint also by considerations of self-interest. The degree of restraint is determined by the intelligence and morals of the parties involved.

These facts should be recognized squarely instead of being glossed over. The opposition of interest between employer and employee makes more difficulty than the opposition between seller and buyer in the purchase and sale of commodities, because in the purchase and sale of service the quantity and quality cannot be so accurately defined as in the case of commodities. With a commodity the price is but one factor. Other factors are quantity and quality. Where would be the much paraded harmony between commodity seller and buyer if the quantity of goods to be delivered for a certain sum of money were not precisely fixed in the bargain but were left to the will of the shipper, checked by the whim of an inspector at the buyer's plant, or if quality should vary according to the general state of the market at the time of delivery? If buyers and sellers of commodities had to transact business on as loose terms as often obtain between employers and employees there would be endless trouble and confusion. The labor issue should be faced with candid recognition of the actual fact that in certain respects there is no mutuality of interest.

Altoona & Logan Valley Electric Railway Co., Altoona, Pa., will build an addition 60 ft. x 70 ft. to its power plant to house a new generator, which will double the company's present capacity.

John B. Smiley, president Poldi Steel Corporation of America, 120 Broadway, New York, has sailed for Europe and will be abroad until January.

RAILROAD BUYING

President Campbell Says It Is an Important Contributor to Prosperity

YOUNGSTOWN, Oct. 31.—Steel prospect is hopeful, in opinion of President James A. Campbell of the Youngstown Sheet & Tube Co., who states that railroad requirements are supplying a large part of the mills' current backlog. He voices the opinion that buying will not be in such volume as to force prices to higher levels and that costs will not permit them to recede. A stabilization around current levels is regarded therefore as likely.

"I think we'll have all the business the railroads can handle," he states. "In their present condition, the carriers could not move 100 per cent. production of our industries. Export business is so reduced because of disorganized conditions in Europe that we are not likely to operate full for some time."

Sheet prices, he points out, are declining to the level of the American Sheet & Tin Plate Co. "With nearly the full capacity of the country's sheet mills engaged, it is not surprising to see a recession in prices. The demand for sheets is still firm, but many companies believe they have to work to capacity, and this is the reason they are taking business at lower levels to fill their rolling schedules."

October shipments from the Sheet & Tube company properties were heavy, he adds.

An important customer of another Valley independent has made inquiries as to prices to apply on first quarter, 1923 business.

Car Supply Still Short

YOUNGSTOWN, Oct. 31.—Industry is still confronted by inadequacy of car supply, but executives look for improvement in this respect upon the close of navigation late in November. They expect that large numbers of open top cars, now diverted to the coal traffic, will be released for industrial freight. The Valley is receiving a larger supply of box cars, especially from the Pennsylvania Railroad. Many such cars are being routed from Eastern centers westward and are being loaded with tin plate and sheets.

Mills with desirable railroad connections have been able to make substantial inroads into piled tonnages of steel requiring box cars. One plant at Niles, tapped by only one road, has been an exception, however. While 4000 tons of an accumulated output have been moved this month, in addition to current production, the plant still has over 6000 tons piled, awaiting shipment.

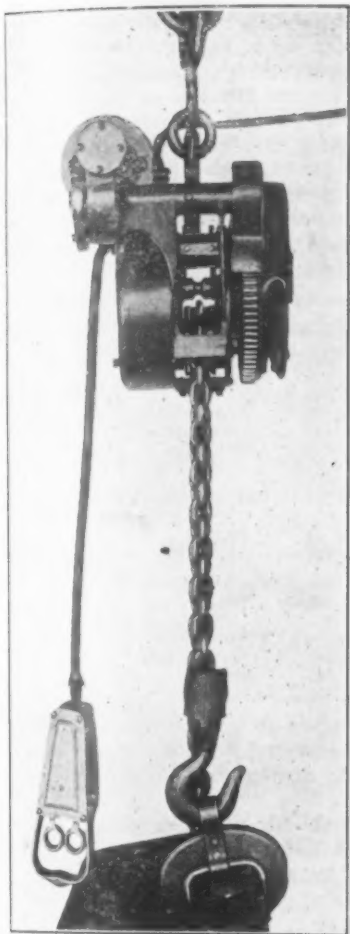
Many bad order cars are being used, and one mill states that nine of every ten cars it has received the past month, in box cars, have been "bad order." In many cases it has been necessary, with such equipment, to wrap the material shipped, such as sheets, in tar paper. Where the buyer desired early shipment, open top cars have been occasionally used, with a temporary covering rigged up.

Rates on Limestone and Coal Not Unreasonable

WASHINGTON, Oct. 31.—Dismissing the complaint of the Minnesota Steel Co. vs. Director General and Duluth, Missabe & Northern Railroad, the Interstate Commerce Commission in a decision last Saturday held that the rates of \$7.50 per car plus 20c. per net ton on limestone and \$7.50 per car plus 15c. per net ton on coal from the dock to Steelton, Minn., on shipments between June 25, 1918, and Nov. 15, 1918, during Federal control, were not unreasonable. The rates mentioned represent increases effective June 25, 1918. The complainant protested against the increases and on Nov. 15, 1918, a rate of \$9.50 per car, which it was claimed would have been a reasonable rate on the shipments concerned, was established, applicable on coal or limestone.

New Motor-Driven Chain Hoist

An electrically operated material-handling device, known as the motorbloc, intended to serve in the field between that of the standard chain hoist and the traveling electric hoist, has been placed on the market by the Motorbloc Corporation, Summerdale, Philadelphia.



Current for the Portable Motor-Driven Chain Hoist Is Taken from the Nearest Electrical Circuit and Control Is by the Pendant Shown

It is readily portable and arranged to take current from the nearest electric circuit. Control is by means of the pendant shown in the accompanying illustration of the device. The machine is made up of a spur-gear chain hoist of steel construction, having a heavy-duty motor of special design and reduction gearing. A slip friction clutch is provided which is applied by means of a malleable iron supporting bracket. Care is said to have been used in avoiding stresses of the hoisting mechanism beyond the loads and speeds for which it is proportioned for hand operation. Ruggedness to withstand overloads and the abuse to which equipment of this character is frequently subjected is a feature also emphasized.

The armature shaft and worm are carried in ball bearings and means

provided for automatic lubrication. The pendant controller is self-contained and may be conveniently used by the fingers of one hand, thus leaving the other hand free to guide the load and permitting one man to lift and place the load. Operation is safeguarded by the use of the ring-oiled slip friction clutch, which is designed to prevent damage to the hoist parts and chain from over running, at the same time protecting the motor from overload, without the use of an electric limit switch.

For places where current is not available, or in the event of failure of electric power, the hand chain can be conveniently applied, and the hoist operated as an ordinary block. The electrifying unit can be applied to standard chain hoists already in service. The 1-ton size complete weighs 148 lb.

During the eight months ending with Aug. 31, last, shipments by the Atlas Tack Corporation, Fairhaven, Mass., in tonnage, showed an increase of 71 per cent as compared with those for the corresponding period last year. Due to the downward readjustment of prices, sales, in dollars and cents, show an increase of but 37½ per cent.

The Lake Torpedo Co., Bridgeport, Conn., plant has completed a twenty-year submarine construction plan for the Government, and the number of employees reduced from 2000 to a mere handful, retained to keep equipment and plants in good condition. Just when activities will resume is problematical.

STEEL CORPORATION EARNINGS

Little Change Compared with Second Quarter—September's Poor Showing

The report of the United States Steel Corporation for the third quarter of 1922 shows little change in net earnings as compared with the second quarter. In the second quarter, the net earnings were \$27,286,945, and in the third, \$27,468,339. September made the poorest showing of any month since February of this year, its earnings being \$7,019,590, while the earnings for August were \$10,615,085. The deficit after the paying of dividends was \$1,339,602, which compares with \$1,462,345 for the preceding quarter. The usual quarterly dividends of 1¼ per cent on the preferred and 1¼ per cent on the common stocks were declared.

The earnings for the first three quarters of 1922 and the preceding three years were as follows:

Quarters	1922	1921	1920	1919
First....	\$19,339,985	\$32,286,722	\$42,089,019	\$33,513,384
Second....	27,286,945	21,892,016	43,155,705	34,331,301
Third....	27,468,339	18,918,058	48,051,540	40,177,232
Fourth....		19,612,033	43,877,862	35,791,302

Net earnings each year	\$92,708,827	\$177,174,126	\$143,813,219
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Earnings for Third Quarter

	Earnings Before Charging Interest on the Subsidiary Companies' Bonds Outstanding	Less: Interest on the Subsidiary Companies' Bonds Outstanding	Balance of Earnings
July, 1922....	\$10,544,674	\$711,010	\$9,833,664
Aug., 1922....	11,324,059	708,974	10,615,085
Sept., 1922....	7,727,721	708,131	7,019,590
	\$29,596,454	\$2,128,115	
Net earnings			\$27,468,339
Less, charges and allowances for depreciation and sinking funds			11,170,945
Net income			\$16,297,394
Deficit: Interest for the quarter on U. S. Steel Corporation bonds....		\$4,778,296	
Premium on bonds redeemed.....		200,000	
			4,978,296
Balance			\$11,319,098
Dividends on stocks of the United States Steel Corporation, viz.:			
Preferred, 1¼ per cent.....		\$6,304,919	
Common, 1¼ per cent.....		6,353,781	
			12,658,700
Deficit			\$1,339,602

Machinery to Be Sold by Government

The catalog just issued by the Emergency Fleet Corporation contains 1486 different lots of material which will be offered for sale, Nov. 1, 2 and 3 at Hog Island. Among machinery supplies are noted a large quantity of wrenches in every conceivable size and type. There are many rivet sets, punches and blacksmith tools. A number of steam pumps are included, among which are 19-20-in. suction by 20-in. discharge; Kingsford Foundry & Machine Co. centrifugal pumps direct connected to 11 x 9 steam engine. These pumps are designed for a circulating pump for 8000 sq. ft. condensers. Among items of shop machinery offered are feed water heaters, small vertical steam engines, four Wheland 10-in. x 10-in. windlasses, three 8¼-in. x 10-in. Hyde windlasses, and other auxiliaries and deck equipment; a Stenton-Ross horizontal woodworking planer, having 48-in. blade, General Electric spot welder, electric reaming machine, Lysholm plate punch table, a gas-driven portable wood saw table, a heavy duty hydraulic punch and Pangborn sand blast outfit, as well as a number of electric motors of various horse power, all A. C. 3 phase, 60 cycle, 440 volts. There is a considerable quantity of plumbing material, such as is used in industrial plants and consisting of white enamel porcelain lined gang wash troughs and washroom fittings.

Application for further information should be made to J. T. Eason, sales manager, United States Shipping Board Emergency Fleet Corporation, Hog Island, Pa.

Iron and Steel Exports Again Decrease

Drop 3½ Per Cent Below August and Are Smaller Than Any Other Month Since February—Fourth Successive Monthly Reduction

WASHINGTON, Oct. 31.—Continuing its decline, which set in in June, the export movement of iron and steel products in September aggregated only 140,455 gross tons valued at \$14,380,851, as compared with 145,640

Fordney-McCumber tariff act, the latter going into effect Sept. 21. The Customs Division of the Treasury and the Bureau of Foreign and Domestic Commerce, Department of Commerce, are completing reports of all shipments up to Sept. 21, under the old tariff act, and will make the report cover this period of the month only; while the first imports under the new classification included in the new tariff law will embrace the

Exports of Iron and Steel—Gross Tons

	Nine Months Ending September			
	1921	1922	1921	1922
Pig iron	2,889	5,203	20,801	22,767
Ferromanganese	186	70	604	1,054
Ferrosilicon	3	89	221	366
Scrap	1,387	2,419	27,201	55,393
Ingot, blooms, billets, sheet bar, skelp	1,318	6,810	8,091	83,231
Iron and steel bars	4,270	10,881	173,693	138,757
Alloy steel bars*	—	379	—	3,406
Wire rods	794	1,401	11,975	36,516
Plates, iron and steel	10,088	11,616	303,360	83,303
Sheets, galvanized	2,628	5,697	45,569	88,699
Sheets, black steel	16,560	9,231	101,185	197,888
Sheets, black iron	347	930	10,555	9,519
Hoops, bands, strip steel	1,013	2,502	15,793	24,959
Tin plate, terne plate, etc.	4,724	6,357	84,672	59,902
Structural shapes, plain material	11,531	10,898	266,008	96,696
Structural material, fabricated	770	3,054	8,707	35,135
Steel rails	20,442	18,451	282,162	220,472
Rail fastenings, switches, frogs, etc.	211	2,723	6,965	26,983
Boiler tubes, welded pipe and fittings	9,019	20,202	310,057	138,053
Cast iron pipe and fittings	2,148	2,351	42,893	19,621
Plain wire	1,519	4,667	58,282	91,412
Barbed wire and woven wire fencing	1,193	7,283	22,539	56,511
Wire cloth and screening*	—	203	—	1,145
Wire rope and cable*	—	458	—	3,447
Wire nails	797	2,320	19,205	46,836
All other nails and tacks	345	659	4,401	6,642
Horseshoes	63	133	468	731
Bolts, nuts, rivets and washers, except track	944	1,404	21,417	13,270
Car wheels and axles†	—	1,126	—	12,630
Iron castings†	—	664	—	7,541
Steel castings†	—	173	—	1,713
Forgings†	—	91	—	1,726
Machine screws†	—	10	—	145
Total	95,169	140,455	1,846,824	1,586,369

*Not reported separately, prior to January, 1922.

†Previous to January, 1922, reported by value only.

tons in August, valued at \$13,963,749. There was, therefore, an increase in value for September of \$417,102 over August, but a decrease of over 5000 tons. Exports of machinery for September also showed a slight decline, being valued at \$19,160,208 as compared with \$20,257,413 in August and with \$19,689,318 in September, 1921.

Compilation of import figures has been delayed owing to the change from the Underwood-Simmons to the

Number and Values of Machine Tools Exported in August and September

	August, 1922		September, 1922	
	Number	Value	Number	Value
Lathes	85	\$52,963	67	\$54,874
Boring and drilling machines	94	31,370	93	40,628
Planers, shapers and slotters	25	11,980	13	15,758
Bending and power presses	19	16,061	21	11,085
Gear cutters	10	15,290	26	14,667
Milling machines	36	27,631	27	29,662
Sawing machines	13	3,145	23	5,041
Thread cutting and screw machines	118	13,530	42	22,924
Punching and shearing machines	17	6,735	18	7,171
Power hammers	15	10,534	27	20,886
Rolling machines	1	734	2	3,897
Wire-drawing machines	9	1,665	1	81
Polishing and burnishing machines	4	396	7	1,265
Sharpening and grinding machines	1,375	79,356	1,081	56,468
Total	1,821	\$271,390	1,448	\$284,407

Countries of Consumption

Following are the principal destinations of some of the leading steel products exported during September:

Galvanized Sheets		Steel Rails	
	Gross Tons		Gross Tons
Canada	2,433	Japan	5,115
Philippine Islands ..	873	Dutch E. Indies	3,024
Cuba	448	Colombia	2,195
		Argentina	1,548
Black Steel Sheets		Galvanized Wire	
Japan	4,661	United Kingdom	1,016
Canada	4,197	Brazil	852
		Argentina	654
Tin Plate		Barbed Wire	
Japan	2,039	Brazil	2,119
Canada	2,015	Wire Nails	
Brazil	541	United Kingdom	944
		Mexico	175

period from Sept. 21, when it became effective, to the end of October. It is expected that the import figures for the first three weeks of September will be available in a day or so.

Iron and steel exports for the nine months ending with September totaled 1,586,369 tons valued at \$143.

Exports, January, 1920, to August, 1922, Inclusive

	All Iron and Steel	Gross Tons	Pig Iron	Semi-finished Material
*Average, 1912 to 1914	547,394	221,582	145,720	145,720
*Average, 1915 to 1918	5,295,333	438,462	1,468,026	1,468,026
Calendar year 1919	4,239,837	309,682	258,907	258,907
Fiscal year 1920	4,212,732	248,126	288,766	288,766
Calendar year 1920	4,961,851	217,958	216,873	216,873
January, 1921	547,394	3,710	315	315
February	393,328	1,307	92	92
March	230,635	2,320	1,023	1,023
April	162,592	1,234	678	678
May	142,551	2,541	749	749
June	119,081	1,689	1,106	1,106
Fiscal year 1921	4,168,619	129,541	82,549	82,549
July	86,523	2,744	263	263
August	75,827	2,424	2,447	2,447
September	95,169	3,078	1,318	1,318
October	106,582	2,830	153	153
November	122,290	1,299	1,869	1,869
December	134,415	2,550	250	250
Calendar year 1921	2,213,042	28,305	10,363	10,363
January, 1922	160,920	1,043	4,683	4,683
February	133,975	1,430	6,627	6,627
March	208,843	2,724	10,002	10,002
April	198,830	2,750	9,376	9,376
May	230,062	3,897	13,091	13,091
June	212,295	1,996	13,178	13,178
Fiscal year 1922	1,721,418	28,330	63,127	63,127
July	157,169	1,943	10,149	10,149
August	145,640	1,791	9,353	9,353
September	140,455	5,203	6,810	6,810
Nine months	1,586,369	22,767	83,231	83,231

*Calendar years.

408,506, as compared with 1,846,824 tons valued at \$281,536,789 for the corresponding period of last year. The shipments for September exceeded by approximately 45,000 tons those of the same month of last year, when they amounted to 95,169 tons valued at \$12,893,995. The shipments for September of this year, however, were only 50 per cent as great as the British iron

and steel exports for September, which amounted to practically 280,000 tons.

The largest items of American steel exports in September included boiler tubes, welded pipe and fittings, the foreign shipments of which amounted to 20,202 tons. Ranking second were steel rails. Of the 18,451 tons of rail exports, 5115 tons went to Japan, which country revived somewhat its purchases of steel products in September. Of the 9231 tons of black sheets exported that month, Japan took 4661 tons.

Striking changes have taken place in the character of outgo of steel products during the past year. Black

996. For the nine months, this year's total figure of \$176,640,215 is barely more than half the 1921 figure of \$349,043,145.

Regulations for Carrying Out China Trade Act

WASHINGTON, Oct. 31.—Secretary of Commerce Hoover yesterday issued regulations for carrying out the provisions of the China trade act, approved by the President Sept. 19, which is considered to be one of the most important measures from the standpoint of foreign trade promotion that has been enacted by Congress in years. To obtain the benefits of the act, firms must be organized as District of Columbia organizations with the specific purpose of trading in China.

Owing to special provisions by Great Britain, France and Japan for firms and corporations operating in China, American establishments in the China trade have been suffering under a heavy handicap which is removed by the China trade act. It provides for exemption from Federal income taxation of stock in corporations directly engaged in commerce in China, held by Chinese or American stockholders resident in China, provided the amount of money so exempted is distributed annually as a special dividend to such stockholders. The act, it is explained in a statement from the Department of Commerce, places American trade in China for the first time on an equality with that of Great Britain, France and Japan.

Acting Commercial Attache Frank Rhea, Peking, has been designated by Secretary Hoover as registrar under the terms of the act, and F. R. Eldridge, chief of the Far Eastern division of the Department of Commerce, as assistant registrar. Application for registration should be addressed to the Assistant Registrar, China Trade Act, Department of Commerce, Washington.

The regulations issued by Mr. Hoover relate to applications for certificates of incorporation, registration fees, certificate of property value, certificate of amendment of articles of incorporation or authorization for dissolution or extension, annual reports, inspection of accounts and appeals from decisions of the registrar.

A tabulation from supposedly reliable sources in Shanghai has been received by the department showing the number of foreign firms doing business in China for the period 1914-1921, inclusive. For the latter year the total was 9511 firms, with 240,769, of which 412 were American firms with 8230 persons. Japanese firms greatly predominate, having had 6141 firms with 144,434 persons. Russia was second, with 1613 firms and 68,250 persons, and Great Britain third with 703 firms and 9298 persons.

Production of Anthracite Increases

WASHINGTON, Oct. 31.—Production of about 10,400,000 net tons of soft and 2,100,000 net tons of anthracite coal in the fourth week of October is indicated by preliminary returns to the Geological Survey. The revised estimates for the third week show 10,365,000 tons of bituminous and 2,003,000 tons of anthracite. A slight increase in the total coal raised is thus shown for the fourth week, as compared with the previous week, but the increase is practically entirely in the output of anthracite.

The number of cars of bituminous coal loaded on Monday, Oct. 16, as reported by the railroads, was 43,243, a new high record for the year. On Tuesday loadings declined to 30,724 cars, and by Thursday loadings declined to 28,987 cars. Full returns on loadings for the week are expected to show a total of 190,000 cars and indicate a production of 10,400,000 tons.

The gain in the rate of production during the past two weeks reflects some improvement in the transportation situation which, however, remains the principal factor limiting output. Rate of output is approaching adequacy but does not yet assure sufficient coal to meet current needs, the requirement movement up to the lakes, and to provide the desired consumer's stocks.

MACHINERY EXPORTS By Value

	September, 1921	September, 1922	Nine Months Ending September, 1921	September, 1922
Locomotives.....	\$1,493,050	\$217,587	\$25,449,500	\$7,217,779
Other Steam Engines.....	29,102	82,649	1,320,717	1,763,882
Boilers.....	80,960	168,054	4,320,854	850,803
Accessories and Parts.....		105,066		4,587,895
Automobile Engines.....	133,229	205,378	1,390,148	4,215,477
*Other Internal Combustion Engines.....	157,845	362,939	2,970,370	3,187,666
Accessories and Parts for.....		266,424		2,026,127
All Other Parts of Engines.....	698,438		10,222,849	
Complete Tractors, except Agricultural.....	22,261	3,475	5,634,065	103,855
Electric Locomotives.....	59,817		1,506,877	
Other Electric Machinery and Apparatus.....	1,544,876	417,394	23,457,052	6,366,554
Excavating Machinery.....	288,696		2,044,264	
Concrete Mixers.....	25,163	62,329	510,802	452,261
Road Making Machinery.....	73,108		765,365	
Elevators and Elevator Ma- chinery.....	122,066		1,772,407	
Mining and Quarrying Ma- chinery.....	385,778	297,291	6,593,540	2,709,878
Oil Well Machinery.....	398,619		9,978,887	
Pumps.....	492,065	615,687	10,690,224	4,441,110
Lathes.....	65,093	54,874	2,643,649	571,772
Boring and Drilling Machines.....		40,628		436,726
Planers, Shapers and Slotters.....		15,758		209,539
Bending and Power Presses.....		11,085		273,787
Gear Cutters.....		14,667		91,835
Milling Machines.....		29,682		243,535
Sawing Machines.....		5,041		36,431
Thread Cutting and Screw Machines.....		22,924		140,045
Punching and Shearing Ma- chines.....		7,171		120,036
Power Hammers.....		20,886		96,099
Rolling Machines.....		3,897		159,016
Wire-drawing Machines.....		81		11,447
Polishing and Burnishing Ma- chines.....		1,265		11,670
Sharpening and Grinding Ma- chines.....	65,886	56,468	1,000,958	575,803
Other Metal Working Ma- chinery and Parts of.....	495,207	596,508	13,864,640	4,236,917
Textile Machinery.....	1,484,026	640,008	14,859,255	11,567,728
Sewing Machines.....	588,395	641,069	5,764,197	4,724,114
Shoe Machinery.....	70,805	74,349	1,536,644	750,582
Flour-Mill and Gristmill Ma- chinery.....	30,566	28,920	1,365,832	870,557
Sugar-Mill Machinery.....	692,273	548,132	14,135,808	2,439,747
Paper and Pulp Mill Ma- chinery.....	287,666	657,684	2,282,015	1,391,056
Sawmill Machinery.....	31,605	99,124	953,948	471,692
Other Woodworking Ma- chinery.....	111,244	113,965	2,290,279	1,036,751
Refrigerating and Ice Making Machinery.....	103,646	119,692	1,415,789	1,406,821
Air Compressors.....	140,486	126,340	3,431,129	1,593,239
Typewriters.....	518,269	985,996	9,760,192	8,523,424
Power Laundry Machinery.....	43,667	66,063	787,213	497,170
Typesetting Machines.....	150,772	260,591	2,817,958	2,764,295
Printing Presses.....	292,232	173,152	6,515,123	2,627,527
Agricultural Machinery and Implements.....	1,182,454	2,381,364	34,774,828	17,747,430
*All Other Machinery and Parts	7,329,863	8,558,571	120,228,774	72,996,501
Total.....	\$19,689,318	\$19,160,208	\$349,043,145	\$176,640,215

sheets in September were only 9231 tons, compared with 16,560 tons last year. But during the nine months, this year's figure of 197,888 tons was nearly double last year's 101,185 tons. And, in spite of a drop in the total nine months' exports of 14.1 per cent, the amount of scrap sent abroad more than doubled, the tonnage of semi-finished material this year is more than ten times last year's total, wire rods more than trebled, galvanized sheets were almost twice as much as last year and wire, including fencing, provided more than twice last year's tonnage, while wire nails were also more than doubled.

Included in the exports of machinery in September were 1448 machine tools valued at \$284,407 as compared with 1821 tools valued at \$271,390 exported in August. Other metal working machinery and their parts to the value of \$596,508 were exported in September. The largest single item of machinery exports in September was agricultural implements, \$2,381,364, while second place was held by typewriters, whose value was \$985,-

Of 277 Months 116 Were Without Accident

Unusual Safety Record Made in Competition by Worcester Plants
Employing 20,000 Persons—A 22 Per Cent
Gain This Year

BY JOHN NELSON

The Worcester County Safety Council, which has headquarters in Worcester, Mass., and is affiliated with the National Safety Council, has been conducting since Jan. 1 a contest between member firms, representing about 20,000 employees, the unit goal of which is the month without a lost-time accident. The council embraces a wide variety of industry, in which metal and machinery predominate.

Each month an honor roll—a list of firms having perfect scores—is posted at the meeting of the council and given to the newspapers of the city. The successful competitor is credited not only with the one month without an accident, but also with the number of suc-

boys and girls. These are the touchdowns and the home runs.

The results achieved have been direct and cumulative. The council's records of the same firms, employing at the time upward of 20,000 people, in the last four months of 1919, when business was at its full tide, show that the average number of lost time accidents per 100 employees was 0.525 in September, 1.00 in October, 0.440 in November and 0.60 in December.

Compare these figures with those of the last five months under this plan of competitive stimulus, after it had attained its momentum, when manufacturing business had started on the way toward normalcy and some of the works had returned to a full normal. The number of accidents per 100 employees was 0.25 in May, 0.294 in June, 0.279 in July, 0.274 in August and 0.27 in September.

The one month in common between 1919 and 1922 in these figures, September, shows the contrast of 0.525 and 0.270, which means that the number of accidents was cut nearly in two. The comparison is a fair one, for though works were probably running with more people in 1919, business is now in a state of tension which naturally accompanies the beginning of prosperous times, following a sharp depression, for shop executives and workers alike feel the constant prod of the sales department to get out goods which customers had deferred buying until the last minute and demanded on the instant. Consequently the fact, generally accepted, that with a rush of business accident hazard increases applies this year as well as in 1919.

Fewer Accidents by 22 Per Cent

The actual improvement wrought since the first of the year as shown in the figures is by no means small. The average lost-time accidents per 100 employees for the first four months of this year was 0.35; for the last five months of the competition it was 0.273. This is a decrease of 22 per cent. Any system that will prevent 22 out of every 100 accidents that otherwise might be expected is well worth while. And this is a comparison between one period and another of the operation of the plan. It simply means cumulative results, and not by any means the total results. The comparison in this respect is fairer with the record of 1919. The Worcester plan has proved to those who are included in its operation that it is a powerful stimulus to the working of safety systems in mills and factories.

The Perfect Score Months of Competing Firms in the
Worcester County Safety Council's Competition
Between Its Members

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.
Arcade Malleable Iron Co.			X			X	X		X
American Steel & Wire Co.									
Central Works	X	X	X	X				X	
South Works									
Baldwin Chain & Mfg. Co.	X				X	X	X		
Boston Pressed Metal Co.			X		X				
Curtis & Marble Mach. Co.	X	X	X			X	X		X
Fitchburg Gas & Elec. Co.							X	X	X
Graton & Knight Mfg. Co.			X		X	X	X	X	X
Hobbs Mfg. Co.		X	X	X	X	X	X	X	X
Rice, Barton & Fales	X	X			X				
S. Slater & Sons			X	X	X				
United States Envelope Co.									
W. H. Hill Div.				X	X	X	X	X	X
Logan Drinking Cup				X	X	X	X	X	X
Logan, Swift & Brigham				X	X	X	X	X	X
Whitcomb Div.				X	X	X	X	X	X
Walden-Worcester, Inc.		X	X		X		X	X	X
Whittall Mills							X	X	X
Wickwire-Spencer Steel Corporation									
Clinton Works		X	X		X	X			
Goddard Works									
Morgan Works		X	X		X	X	X	X	X
National Works	X	X	X	X	X	X	X	X	X
Palmer Works		X	X		X	X		X	X
Spencer Works	X				X	X		X	X
Wright Works		X	X		X				
Wire Goods Co.	X						X	X	
Worcester Electric Light Co.					X	X			
Worcester Gas Light Co.							X		
Worcester Stamped Metal Co.	X	X	X			X	X	X	X
M. S. Wright Co.		X	X		X	X	X	X	
Wyman-Gordon Co.	X	X							
Total	9	13	16	6	18	14	15	12	13

cessive perfect months. In the nine months several plants have had seven or eight months in a row.

The combined operation of the thirty-three firms which have submitted their figures during the contest gives 277 working months, and of these 116 were without accident—over forty per cent. These figures, however, should not be taken without explanation. The great majority of perfect scores were made by firms relatively small or of moderate size, so that were the clean-score months reduced to the number of employees represented, the results would appear in a different light. But just as they stand they are impressive.

The competition is unique among "sporting propositions," as it has come to be accepted by officials of the contesting firms. Nothing quite of the sort had ever been attempted, so far as its originators know. He wins who makes life and limb the safer for his workers. Wherever in sports the name of an industrial concern is involved, whether it be in base ball or football, basket ball or bowling, the desire to win and the pride of winning are felt even to the oldest and most sedate member of the board of directors. In this Worcester plan the winning points of the game are the acts of prevention which save from injury men and women,

Record of Lost-Time Accidents Under the Plan of Competition
Conducted by the Worcester County Safety Council

	No. Firms Reporting	No. Employees	No. Lost-Time Accidents	No. Per 100 Employees
January	27	18,748	85	.453
February	29	19,522	59	.302
March	34	20,396	68	.330
April	32	17,431	65	.320
May	33	18,002	45	.250
June	33	18,338	54	.294
July	25	15,620	43	.279
August	31	18,606	51	.274
September	33	19,656	53	.270
Total	277		523	

It is well known that under ordinary conditions safety work has periods of lagging. Men lose interest. Superintendents and foremen are busy people, and quite naturally, under the stress of management, are prone to shunt what at the moment seems to them an unessential for the essential, which is production. This must be maintained on an economical, efficient basis. When the leaders let down in accident prevention work

the whole shop lets down with them. Safety engineers, giving constant attention to prevention measures, have difficulty in securing co-operation. Finally something happens, usually a serious accident which can be traced directly to neglect or carelessness and we have another stimulus which brings accident prevention to a high level point again.

The stimulus of the competition plan is continuous. Without it the rate of lost-time accidents per 100 employees would now be returning toward the 1919 level. Instead, it is improving, in spite of the increase in employment and in intensity of production.

The reason is the psychological effect of a sporting event. The sporting instinct is inherently an American trait. Owners and managers are watching the score board in Worcester. When a man's own firm name appears in the honor list, he is glad. When it is absent he wants to be shown why it is absent, and men appear on the carpet at his office and are asked pertinent questions. The word goes forth into the mill that "the old man" says this or that, meaning that accidents must not be permitted. Lagging ceases. Safety devices are inspected and rules strictly enforced. It is literally a fact that when a man is injured nowadays in these Worcester county plants he is no longer wholly an object of pity and commiseration. The feeling is that he has gone and spoiled the record. The safety engineers are having the time of their lives, for they have never had such wholehearted co-operation. The people higher up are demanding that the firm's name go on the honor roll, not one month but every month. Naturally the plan is not particularly popular with some superintendents and foremen.

Contrast with Old-Time Record

The day was, not so very many years ago, when managements of works whose processes compelled hazardous occupation—for instance, wire mills—figured on so many fatalities a year, and so many maimings and so many cases of serious septic poisoning and so on. These sinister factors had to be reckoned, reduced to dollars and cents, as a production cost. Many employers of labor still active in business shudder as they recall what happened among their own employees, which would have been prevented had scientific safety methods been developed a decade or two sooner. In those old days a table such as that herewith printed detailing the perfect month honor roll would have been naked indeed.

Take, for example, the South works of the American Steel & Wire Co., operating a steel mill, blooming, rod and wire mills, drawing and treating wire, and having an elaborate industrial railroad—altogether an ideal breeding place of hazards. In the old days the mention of a perfect month without an accident would have been regarded as a grim jest. A perfect week would have been something to boast about. Accident prevention was confined then to the most glaring hazards in this plant, as in practically every other like it in that day.

In 1922 its 2950 workmen went through the long month of August without one lost time accident, and in the other eight months the works accident record was extremely low. So, too, it was at the North works, at the Norton Co., Crompton & Knowles Loom Works and other great establishments.

The smaller Central works of the American Steel & Wire Co. have almost as remarkable a record, in spite of the fact that it has but 250 employees. During five of the nine months it had no lost time accident. The big Wright works of the Wickwire-Spencer Steel Corporation had three clean months, and the Palmer works, also a large establishment, had five. The Worcester Stamped Metal Co., which conducts an industry always regarded as hazardous, had seven months and the Boston Pressed Metal Co. two months. The Graton & Knight Mfg. Co., manufacturer of leather belting, operated its Worcester factory with 1300 men two months without a lost-time accident. The Baldwin Chain & Mfg. Co., had four months; the Hobbs Mfg. Co., which makes paper box machinery and also operates presses, had eight months in a row. The table will show others with most creditable records.

The weak spot in the system of competition, and one which it is proposed to rectify, is that too great a handicap is imposed upon the large concerns. The employer of 1500 men and more cannot hope for the same perfect results in a month as an employer of 200 men. Therefore it is believed to be more fair if some unit were established, as for example 500 men. The employer of less than that number, to score perfect, must have no lost-time accident whatsoever. The employer of 500 to 1000 men could have one accident and still be perfect, the employer of 1000 to 1500 two accidents, and so on.

The method adopted in the collecting of the data of the various industrial plants represented in the competition safeguards each firm against too wide a divulgence of its intimate affairs, such as the number of people it employs and the number and nature of accidents. No member of the Safety Council sees the reports, since they go to a neutral party, Gleason H. MacCullough of the department of mechanical engineering of the Worcester Polytechnic Institute, who is pledged to regard the information as strictly confidential. He has reduced the names to numerals in his tabulations, and occasionally changes the numbering, that information may not be gleaned by deduction.

May Abolish Tax Exemptions

WASHINGTON, Oct. 31.—It was indicated to-day in high sources that Congress may be asked at the next regular session to do away with tax exemption of securities. To do so, it was stated, might require a constitutional amendment which would possibly make the undertaking difficult. It is the belief of the Administration that growing investment in state and municipal securities which are tax exempt is working to the detriment of the Federal Government and is checking investment in industrial and other securities and enterprises.

Reports that the Treasury is considering new taxes are not given credence. The Administration is known to be reluctant to fix any new taxes and would not do so except in the case of necessity. It is stated there is no present necessity, and that on the contrary the Bureau Budget has pared expenditures to a point where it is expected the total deficit will be wiped out within a reasonable time.

New Link-Belt General Catalog

The Link-Belt Co., Chicago, Philadelphia and Indianapolis, has issued a new general catalog No. 400, of 832 pages, cloth bound, obtainable from any Link-Belt branch office. It includes not only the complete Link-Belt line but also the products of the H. W. Caldwell & Son Co. plant. The following is a brief summary of the subjects included in the catalog: Link-Belt chains and wheels, power transmission machinery, bearings, hangers, gears, pulleys, etc.; elevator boots and buckets; screw conveyor equipment, apron and belt conveyors; boiler plant equipment, coal tippie equipment, coal storage, pockets, towers, etc.; car loaders and unloaders, locomotive and crawler type cranes, grab buckets, electric hoists, overhead cranes, telferage, car pullers, revolving screens, sand separators, etc.; lime handling equipment, foundry conveyors and sand revivifiers.

The elimination of waste in industry will be a theme for discussion Nov. 22, at the sixth annual New York State Industrial Conference to be held at the Hotel Lafayette, Buffalo, Nov. 21 to 23. L. W. Wallace, executive secretary, Federated American Engineering Societies, will deliver the opening address at the waste session, his topic being "Wasteful Industrial Habits." H. F. Simmons of the General Electric Co., Schenectady, will speak on "How to Prevent Waste of Materials."

PROGRESS IN MANAGEMENT

Knowledge Now Basis of Judgment—Changes of Attitude—College Courses and Management Societies Increase

That management has definitely progressed along certain main lines in the last 10 years, was a dictum of a paper on "Ten Years Progress in Management," by L. P. Alford, vice-president American Society of Mechanical Engineers. The paper has been read at several branch meetings of the Society. One of these was a joint gathering of the New York groups of the Society, and of the Society of Industrial Engineers and the Taylor Society, held Oct. 17, in New York. The similar meetings, for example, were held at Meriden, Conn., and Plainfield, N. J.

The information on the changes which have taken place since the committee report on the state of industrial management were presented to the American Society of Mechanical Engineers in 1912, were obtained by letters and interviews. Quoting from one of the letters and emphasizing it as a well balanced judgment of the situation, it was stated that in the first place good management is more insistent to-day on knowledge as a basis of judgment, rather than the old judgment based on personal observation. Management is more and more demanding costs, a knowledge of inventories, monthly profit and loss statements, statistics and records.

In the second place, management is now undergoing a definite metamorphosis in industrial relations, and managers are waking up to the fact that they owe more to their employees than mere wages, and that whistle blow and hustle are not all there is to factory operation. It was further said that it is this belief and the spirit developing, rather than the volume of action up to date, which is a matter of very definite progress in the past ten years of management.

Ten opinions were cited and from these and other facts a group of factors marking progress were deduced, the factors being arranged in three groups.

The first group of factors concerns changes in mental attitude. The controversy as to whether management is a science or an art has subsided and the attitude of opposition and mistrust toward management has disappeared. An appreciation of the problems of management has grown among those responsible for the carrying on of industry and acceptance of the principles of management has broadened among engineers, executives in industries and educators.

The second group of factors of progress takes up the application of management methods and it is pointed out that the engineering or scientific method has extended in industrial cost accounting. Among the developments are uniform cost accounting systems, those of 64 manufacturers' associations being emphasized. The theory and method of determining and applying standard costs and of determining losses, the forecasting of sales leading to long-term production schedules, and the budgeting of future expenditures were mentioned. Appreciation of the possibilities and advantages of standardization, simplification and elimination of waste during the last two years were also included in this group. The demand for knowledge, facts as a basis for judgment, has grown insistent in all good management. This has led, among other developments, to a widespread use of specification and graphics as a means of recording and communicating management knowledge.

The third group of factors marking the progress of management concerns especially significant developments, which, after being stated, are subject to explanation and comment. Management activities have broadened far beyond the installation of those mechanisms which are usually associated with the Taylor system. Some eight or 10 of the leading American engineering schools have established courses in management since 1912. Appreciation of the importance of the human factor in industry and attempts at its study from a fact basis were emphasized as the most striking management developments. Management engineers

have declared that the service motive must prevail in industry and that all questions concerning human relationships must be considered in a spirit devoid of arbitrariness or autocratic feeling.

Accepted Management Mechanisms

Information as to the use of management mechanisms was secured, the question indicating the line of inquiry being "What, if any, mechanisms of management do you consider as generally accepted in principle and in practice?" The conclusion arrived at was that certain mechanisms of management have made decided headway in acceptance both in principle and practice, and from an assay of four industries, the importance of application yields two groups. In the first group are balance of stores, incentive wage plan, purchase control, selection and placement, and in the second group, cost control, idle-time analysis, planning and time study. It was emphasized that in the installation of such mechanisms a significant change is becoming evident. In the early days the mechanisms concerned the physical means of production and they were originated by the executives and were ordered into the shops. At a later date the value of methods which concerned the worker was appreciated. Training was the first to have any widespread trial. But the attitude was still the developing of a mechanism from the top downward.

Within the decade under review, it was pointed out that another attitude has been adopted in a few instances. It seeks to make the foremen and even the workers consciously parties to the development of the plans before they are put into effect. It endeavors to arouse interest, to inspire to achievement, to release creative energy. Its effect is to install methods and mechanisms from the bottom upward with celerity and improvement in personnel relations.

The rise of works councils in American industries is commented on, several hundred having been established during the past decade. Their development, it is pointed out, has been in response to a desire on the part of the workers for a means of expressing their beliefs and wishes in regard to matters arising in employment, and on the part of the management for means of communicating with their employees and gaining and holding their confidence and good will. The movement emphasizes the fact that the development of the relationships of employer and employed is a responsibility of the management.

Dayton Furnaces Being Rebuilt

The Cumberland Coal & Iron Co., 149 Broadway, New York, of which Arthur M. Wickwire, a lawyer, is president, is rebuilding the two Dayton blast furnaces at Dayton, Tenn., which the company recently acquired from the Dayton Coal, Iron & Railway Co., and expects to put them in blast some time in the spring. The Dayton furnaces, which were formerly owned by English interests, have been out of blast since 1913, when the owners suffered financial reverses. The furnaces have been in charge of a receiver and were recently bought by the Cumberland Coal & Iron Co. at a receiver's sale.

The furnaces will be relined and skip hoists will be built. Other needed repairs will be made to fit the stacks for operation on a more economical basis. In addition to the furnaces, the Cumberland Coal & Iron Co. has acquired ore and coal lands, bee hive coke ovens and limestone quarries, the plant being self-contained in every particular.

During its former operation the furnace property turned out a high grade of iron, which found a market in Tennessee, Kentucky, southern Ohio and Indiana, and some went as far as the Chicago district.

Domestic sales of oak leather belting for September amounted to 475,380 lb., valued at \$797,213, a reduction of nearly 20 per cent from the 590,618 lb. and \$967,433 value in August. For September, 1921, the figures were 311,709 lb. and \$525,230.

Preparing for Investigations Under Tariff

Commission Announces Methods of Procedure Under Flexible Provisions—Large Appropriations for Expenses Necessary

BY L. W. MOFFETT

WASHINGTON, Oct. 31—Issuance by the United States Tariff Commission last Thursday of rules of procedure, under the flexible and other provisions of the Fordney-McCumber tariff act, has set in motion the machinery for tariff-making that is distinctly new in the annals of United States history. Evidently, however, it will be some time before the commission can get fully under way in the discharge of its enlarged responsibilities. While reorganization of the commission and enlargement of its forces are proceeding, its funds, as previously pointed out, are extremely limited. As a matter of fact, at present the commission has only its ordinary appropriations to work on, although Congress greatly increased the powers of the commission which Chairman Burgess has said will require trebling of its forces of experts. Assurance has been given to the commission that it will be granted funds to carry on its work and it is understood that the Bureau of the Budget has tentatively set aside \$350,000 for this purpose. This sum is considered by many who have studied the situation to be entirely inadequate. As it happens it represents approximately the cost of each of the investigations made by the Taft tariff board regarding the wool and cotton industries.

The provisions of the Fordney-McCumber act, will, if carried out properly, involve investigations of many industries from time to time. Despite this handicap, however, it is believed that public sentiment is so strongly in favor of the new provisions of the Fordney-McCumber tariff act, because they at least mean a partial removal of tariff from politics, that sooner or later the commission will be more amply provided with funds to conduct its work. The country undoubtedly will watch with interest the effect of the operation of the rules of procedure covering the three provisions of the act to which they apply.

Power Conferred on President

The first of these, as pointed out by Vice-Chairman William S. Culbertson of the commission before the American Manufacturers' Export Association in New York last Thursday, is section 315, which permits the President to increase or decrease by not more than 50 per cent in tariff rates after an investigation by the commission that shows such a change is necessary to equalize "the difference in costs of production in the United States and the principal competing country." He may also change the classification of articles and in the case of those taking ad valorem duties, he may accomplish this by substituting American for foreign valuation. But in doing this, he is not permitted to increase the ad valorem rate. An increase, of course, is accomplished by changing from foreign to American valuation.

The second of the new provisions is carried in section 316 and assumes the character of a supplement to tariff rates. It is designed to protect American industry against unfair methods and unfair acts in the importation of goods. The section provides that additional duties may be levied against any importations by individuals engaged in unfair price cutting, full-line forcing, commercial bribery, or any other type of unfair competition. When the unfair competition is extreme in its nature, offenders may be prohibited from importing into the United States.

The third new provision, section 317, is intended to aid American industry by protecting American export trade and this section, according to Mr. Culbertson, is of greater significance to the export trade. This section brings to a definite head a settled policy on tariff negotiations and gives the President power to impose

additional duties or even prohibition upon the whole or a part of the imports, into the United States from any foreign country which denies to American foreign trade treatment equal to that accorded to the trade of any foreign country. It further provides protection against preferential export taxes by permitting the President to penalize imports into the United States of the products of any industry in a foreign country which benefits by preferential export taxes granted by a third country.

Rules of Procedure

Concerning the rules of procedure issued by the commission last week, Mr. Culbertson said: "They set forth how applications for investigations shall be made and under what conditions and in what manner the commission will conduct formal investigations upon which the President may change the tariff law. Anyone can apply for an investigation. The application need not be in any special form, but it must be in writing and signed by or on behalf of the applicant. It must also recite the relief sought and the reasons therefor. Obviously, the mere filing of an application does not obligate us to proceed formally. We shall not order an investigation unless the application or a preliminary investigation discloses to our satisfaction that there are good and sufficient reasons for doing so under the law.

"We can order a formal investigation upon our own initiative as well as upon application and we are not confined to the issues presented in an application; we may broaden, narrow, or modify the issues to be determined.

"When we finally decide to proceed formally with an investigation, we shall issue and publish a notice of its nature and scope. Any person who then can show to our satisfaction an interest in the subject matter of the investigation may enter his appearance in person or by a representative. He will be notified of public hearings and afforded opportunity to offer such testimony as we may deem necessary for a full presentation of the facts. Our hearings will usually be open to the public. Evidence submitted will be subject to verification from the books and records of the parties in interest. In conjunction with hearings, we shall conduct field investigations both in the United States and in foreign countries.

"In the case of formal investigations, our procedure will be judicial in character. Our rules provide for the attendance and examination of witnesses, the production of documentary evidence, the issuance of subpoenas, and the taking of depositions. The commissioner or investigator in charge of any investigation will summarize the hearings and the information obtained by field investigation and will prepare a report. Parties of record will be permitted, before they file their briefs, to examine this report, as well as the record, except such portions as relate to trade secrets and processes.

"Final hearings will, of course, be before the commission. Parties of record may file briefs and in some cases present oral arguments. Our findings will be in writing, and will be transmitted with the record to the President for his action."

Reasons for New Methods

Reasons for new methods in tariff-making were explained as follows: "A number of causes have led to this new departure in tariff-making, which in fact is merely the logical outcome of a long struggle on the

(Concluded on page 1181)

JAPANESE COPPER IMPROVES

Demand Beginning to Exceed Supply — High Prices of Domestic Product Damaging to Japanese Manufacturers

TOKIO, JAPAN, Oct. 4.—The statistical position of copper has been improving, the consumption steadily outstripping the supply. In spite of this encouraging condition, the price remained the same last week, mainly due to lack of confidence in the market. This lack of confidence is attributed to the intrigue of brokers who are attempting to create disturbances. A calm market is fatal to their interests because there are no waves of buying. So they are trying, it is rumored, to create unrest among consumers, who are doubtful as to what they should do and have been hesitant for some time. The policy of price regulation may also be partly responsible for this inactive state of the market.

Such is the situation at the moment, but judging from the general point of view it may be safe to conclude that the tendency is upward, because whatever artificial measures are resorted to by the brokers, the fundamental fact that consumption is going ahead of supply cannot fail to make itself felt in the end. There has been no change during the present week in the figure of stock on the market, which was 9000 tons at the end of last week.

Hitherto quotations have been based on the imported price of American electrolytic copper as a standard, but quotations have lately declined from 46 yen to 43.50 yen, "quite ignoring the import price of the American product and the increase of the import duty by 7 yen per 100 kin," as a Japanese paper states. Among the copper merchants, keen competition is now prevailing, while copper goods have declined in price extraordinarily. Competition on copper electric wire is serious and merchants are quoting prices that are

less than cost. The cutting off of a supply of cheap copper from abroad led, directly the duty was increased to higher prices. It was predicted at the time that this was likely to be a fatal blow to the various promising copper consuming industries of Japan.

In electrolytic copper, in spite of inactivity and dullness, stocks have gradually decreased, and with the season of increased demand beginning the market has been more or less strengthened, although quotations remain the same. The Osaka arsenal is reported to require 500 tons of electrolytic copper. In the Tokio market, quotations stand at 44.70 yen to 44.80 yen per 100 kin for large lots and 45 yen for small lots, while in the Osaka market, quotations are 44 yen for large lots and 44.30 yen for small lots.

Shanghai Market Depressed

SHANGHAI, CHINA, Oct. 4.—The condition of the iron, steel and metal markets in Shanghai has not yet definitely altered. There are a few changes in prices, but it is doubtful whether they will have any effect in the way of stimulating buyers.

The paralyzing influence of the complicated political situation in China is beginning to be realized. The whole metal market in Shanghai is depressed. Very little cargo moving out of this port into the interior and goods are stagnating. There is no improvement in sight.

There has been some business in Belgian merchant bars at £9 7s. 6d. c.i.f. Shanghai, and a little inquiry for galvanized sheets, but black sheets are dull.

Japan continues to buy rails in the New York market, a large portion of which is Japanese Government business. Manila, P. I., has been buying heavily during the past few weeks of wire nails, bars and galvanized sheets, a large portion of this business going to New York for execution, although there has been some export from Shanghai to Manila.

White House States Position as to Judge Gary's Suggestion

WASHINGTON, Oct. 31.—This Government will give no consideration to an international conference on the debt question until the economic problem involved is worked out by experts, it was stated to-day at the White House in response to a query as to the view of the Administration regarding the suggestion made last week by Judge Gary of the Steel Corporation, before the American Iron and Steel Institute for the holding of an international financial conference in Washington. It was declared at the White House, however, that this Government is willing to participate in an economic conference looking to the betterment of the old world situation.

It was pointed that the Administration does not hold to the opinion often expressed, especially from European sources, that cancellation is the only solution of the debt problem. Opposition to debt cancellation expressed by Judge Gary is the same attitude as that of the Administration. While no definite plan of solving the matter of collecting the debts has been worked out, negotiations are under way, it was declared, in the firm belief that a solution will be found. Meanwhile it was emphasized the Administration will cling strenuously to the conviction that the debts constitute National obligations that should be met.

Shop Safety Enforced by Drama

The safety organization of the Wickwire-Spencer Steel Corporation taught lessons in safety in a new way in a drama given at the Goddard Works at Worcester, Mass., recently, in the presence of 225 officers, superintendents and foremen of the corporation's various Massachusetts plants. The play was written by Winthrop G. Hall of the general manager's office, and Vernon C. King, the company's safety engineer. The per-

formance was highly personal in its characters, for among them were President T. Harry Wickwire, Jr., General Manager John Wheeldon, Assistant General Manager E. C. Bowers, and Stanley Wheeldon and T. H. Wickwire, 3d, sons of the president and general manager. These parts were impersonated by members of the organization, who were made up for the purpose, and other parts were taken by the men themselves, and still others, notably of foremen, had fictitious names, that the rub might be somewhat lightened.

The plot centered upon poorly attended, uninteresting foremen's meetings, and a serious accident in which the sons of the president and general manager were seriously hurt, all because of lack of attention to the safety system. Officials of the company find that the performance has had a salutary effect in stimulating active co-operation in the enforcement of accident prevention rules.

Dr. George Otis Smith Resigns from Geological Survey

WASHINGTON, Oct. 31.—The resignation of Dr. George Otis Smith as director of the Geological Survey has been accepted by President Harding. The resignation was necessary in order that Dr. Smith could continue to serve as a member of the Fact Finding Coal Commission. It is the hope of the Administration that the Department of Interior can arrange for the return of Dr. Smith as director of the Geological Survey after he has completed his work on the commission.

It was also pointed out that Judge Alschuler is not qualified to serve formally as a member of the commission because he is a member of the United States Circuit Court of Appeals and is merely acting formally in connection with the commission. It is also the hope in his case that Congress will pass legislation making it possible for Judge Alschuler to be qualified as member of the commission.

A MANGANESE APPRAISAL

The Country's Resources to Be Investigated by Engineers

It was to be expected that an early move would be made to secure a revision of the manganese ore and ferromanganese duties in the Fordney tariff act. No action in that direction has been taken as yet by steel manufacturers, most if not all of whom were opposed to a high duty on manganese. However, an inquiry has been set on foot to have an impartial determination of the manganese resources of the United States. This has come about through no initiative of manufacturers, but as part of the War Department's inquiry into the extent of the country's resources in minerals particularly required for the carrying on of war.

The attention of all readers of THE IRON AGE who may be able to supply information concerning manganese ores is especially directed to the following statement by a committee that is charged with the manganese inquiry. The statement fully explains the constitution and purpose of the committee, which is composed of C. M. Weld, chairman; D. F. Hewett, Bradley Stoughton and John A. Mathews:

"The Secretary of War has asked the president of the American Institute of Mining and Metallurgical Engineers to supply him with a statement concerning the nation's resources of certain strategic minerals and their availability in the event of war. This inquiry has been referred to a general committee on industrial preparedness, which has joined hands with the Com-

mittee on Foreign and Domestic Mining Policy of the Mining and Metallurgical Society of America in the appointment of joint sub-committees to collect essential data and submit reports on the various metals. The undersigned have been asked to take up the subject of manganese.

"It is the purpose of this manganese committee to attempt a careful survey of our domestic manganese resources and to study these resources in their relation to both peace and war needs.

"The value of the results of this investigation will necessarily depend upon the quantity, accuracy and degree of detail of the data that can be obtained. It is desired, therefore, to make use of every available source of information. Many manganese deposits throughout the country have been examined by engineers and geologists since 1917 and many reports have been printed. There must be many additional reports in the hands of engineers, of mining companies and of owners which might be made available to the committee. The committee will be glad to consider summaries of estimated reserves for districts, but particularly wishes detailed reports on separate mines or deposits with maps (if possible), records of shipments (if any), representative analyses, prospecting records, etc.

"All those sending in such reports and other pertinent information will assist in performing an important public service. Material submitted to the committee will be treated as confidential if it is so requested and after examination will be returned. If original material can not be sent, the committee will be glad to furnish blanks indicating the more essential details which are desired. Send material or write at once to C. M. Weld, 2 Rector Street, New York."

EXPORTS CONTINUE QUIET

Noteworthy Inquiry from Japan for Gas Pipe— Low Prices by British Sellers—Foreign Pig Iron

NEW YORK, Oct. 28.—Quietness continues in exports with the exception of a few inquiries which have recently appeared from Japanese sources. The Chinese market is unchanged. Among the current inquiries now being bid upon by American exporters to Japan, the largest is probably the gas pipe inquiry from the Tokio Gas Co., which calls for 1,219,000 ft. of black gas pipe, $\frac{3}{4}$ to 1 $\frac{1}{2}$ in. While this order may be placed in the United States, it is noteworthy that at least one Japanese export and import house with a branch in New York has, within the past month or two purchased about 1000 tons of various sizes of black gas pipe, which are being carried in stock in Japan. Much of this stock was purchased on a slightly lower pipe market than the present, being shipped on about a 69 per cent discount from list, c.i.f. Japanese port, and a lower quotation might be made for immediate delivery of this stock material than could be obtained on current bids from American sellers, which would probably not be better than 66 per cent off list.

As a further example of the lower quotations obtainable by the Japanese on British and Continental material, a tender for between 1500 and 1600 tons of ship construction material, ship plates, boiler tubes, shapes, bars, etc., from a Japanese shipyard has been placed with British sellers at \$6 to \$7 per ton less than the American delivered price. The ship plates were awarded on a price of £10 per ton and the shapes at £9 18s. per ton, c.i.f. Japan. No further buying by the Imperial Government Railways is noted, with the exception of an order placed recently with a large Japanese house for six power-drive pipe cutting and threading machines manufactured by the Toledo Pipe Threading Machine Co., Toledo, Ohio. Current inquiries from privately owned railroads include a request for bids on 14 miles of 25-lb. rails and the prospect of the early issuance of a tender covering eight miles of 75-lb. rails. No purchases of light gage black sheets are noted.

The recent report of one pig iron importing interest

in New York that German iron is being offered for export to the United States at as low as \$26.75 per ton is considerably discounted by other importers of foreign iron and representatives of German mills in New York. It is generally pointed out that Germany is least able to export pig iron of any of her raw materials and doubt is expressed that Governmental permission could be obtained for foreign sale of German iron in any quantity at this time. In the meantime fair activity in Scotch iron is reported by importers. One importer in New York, who has been bringing in small tonnages of Scotch iron for some time is now offering an iron of guaranteed analysis, which shows: Sil., 2.75; sul., 0.025; mang., 1.05; phos., 0.3, at a duty paid price of \$28.75 per ton, New York. This importer states that he could book numerous orders if immediate delivery were possible. The ocean freight on shipments from United Kingdom ports to Boston has declined from 17s. to 15s., the current rate, which is the same as the rate to New York and Philadelphia.

New Iron and Steel Code

An iron and steel code, which can be used in combination or in conjunction with any other five letter code, has been compiled and will be ready for distribution Dec. 10, by the C. Bensinger Co., 15 Whitehall Street, New York. The code contains specifications for bars, structural material, rails, tin plate, sheets, wire, scrap, etc., complying with the standards of European, Eastern and Spanish speaking countries.

Announcement has been made of the organization of a new Auto Body Co. to operate in connection with the motor plants of the Durant Motor companies. H. Jay Hayes of Detroit is president of the new company and Victor Preston of Grand Rapids is to be engineer.

Administrative and executive offices of the Youngstown Steel Co., Youngstown, Ohio, which is building a mechanical puddling plant at Warren, Ohio, will be moved Nov. 1 to the plant site. Heretofore they have been maintained in the Realty Trust Building, Youngstown.

Iron and Steel Markets

45,000 CARS PENDING

Demand Apart from Railroads Less Active

Car Supply Still a Limiting Factor—Pig Iron and Scrap Prices Lower

The steel market, particularly on the major products, plates, shapes and bars, is coming into a quieter time. Consumption is maintained in most directions, but buyers wait to see that prices, which have been working easier, are entirely freed from the inflating effects of the coal strike and of car troubles. Generally they find that apart from some Steel Corporation subsidiaries the steel companies are lightly booked beyond December.

Car supply, however, is still an uncertain factor. Production has increased slightly in the past week, but in some districts, notably Pittsburgh, box cars have been scarcer again, retarding the movement of certain finished products from the mills. The steady fall in coke prices is taken as the key to the immediate future, particularly of pig iron.

At Chicago car buying not only keeps up but promises to be greater. This week's report shows a total of over 45,000 freight cars and 700 passenger cars in pending inquiries—probably the largest number of cars ever in the market at one time. The steel required is more than 450,000 tons, all of which would be for 1923 delivery, in view of present business on the books of both car builders and mills.

The Steel Corporation's heavy bookings during the coal strike period and the inroads on its operations made by the railroad shopmen's strike are indicated by its recent buying of nearly 100,000 tons of ingots and sheet bars, the ingots going to its pipe subsidiary. On a part of the sheet bars \$40, Youngstown, was paid. The possibility of further purchases is a factor in the sheet-bar market, in which in the past week a \$39 quotation at Youngstown has appeared.

Steel Corporation earnings, which fell off noticeably in September, show the culminating effect of the double strike. With independent steel companies September output was larger than that of August and at all plants October production showed a gain over September.

In the past week the Illinois Steel Co. has increased its steel output to 73 per cent of capacity. The Steel Corporation and the industry as a whole are now close to a 75 per cent operation.

Coke has declined to \$7.50 at ovens, or but little more than half the peak price reached just before the coal strike, and on coke under the Connellsville standard as low as \$6.50 is reported.

With the exception of 12,000 tons of basic sold to an eastern Pennsylvania consumer at \$28.50 to \$29, delivered, no large transactions in pig iron have been reported and the downward trend of prices is still marked. In the South, there has been a decline of \$2 and further weakness has developed in important centers, especially Philadelphia, Cleveland and Pittsburgh. Quotations on foreign irons are declining in harmony with those for domestic grades. Little further buying abroad for shipment

to this country is to be expected, as considerable foreign iron, some of it already on this side, is still the property of importers and brokers. Philadelphia receipts of foreign iron have been 21,000 tons in the past fortnight.

In finished steel the fractional variations from a 2c. basis for plates, shapes and bars are being more closely observed for indications of the trend. At Cleveland, attractive business in reinforcing bars has brought out a concession of \$1 per ton to 1.95c., but 2c. is usually paid for bars.

Plate mills, as for some time, have lighter bookings than are common in other lines. Oil tank work has held up well, with 7000 tons pending and 1500 tons placed this week.

While the recent movement of sheet prices has been toward those of the Steel Corporation, an advance by the latter is a possible development of the near future.

While automobile output is declining, the decline is surprisingly small. Manufacturers are buying little steel at present, particularly alloy steel. For medium priced cars there are orders that will keep many plants running full for the next two months.

The scrap market gives signs of realizing by holders of considerable stocks. At Pittsburgh an independent steel company has bought 60,000 tons of heavy melting steel at about \$21, Pittsburgh. This represents a decline of nearly \$2 from the high point of a few weeks ago.

THE IRON AGE pig iron composite, through a further decline in foundry iron, is \$3 a ton below the high price at the end of September, being now \$29.52. This compares with \$19.97 one year ago.

The composite price for finished steel has also dropped, being 2.466c. per lb. It compares with 2.163c. a year ago and 3.724c. two years ago.

Pittsburgh

Premiums on Finished Materials Disappear—Pig Iron Very Dull

PITTSBURGH, Oct. 31.—The fact that steel mills now are reaching backlog orders carrying considerably lower prices than those now current and that they are delivering against these orders is telling on the structure of prices. While occasional sales of bars still are heard of as high as 2.10c. base, Pittsburgh, and occasionally sales of small tonnages of plates are made at above 2c., Pittsburgh, few consumers are suffering sufficiently for supplies to be willing to pay even 2c., and that level now may be regarded as the top of the market. The heavy tonnage products are the weakest in the market because so many consumers are comfortably fixed with supplies priced well below to-day's levels. In other lines, there is a disposition on the part of buyers to wait on shipments against old and low priced contracts rather than seek new tonnages, and while prices only in a few instances have declined materially, there has been a virtual disappearance of delivery premiums because of the less urgent demand. The entire list of prices is threatened by the weakness in plates, shapes and bars, which in time must necessarily mean the diversion of steel away from them into those products where there

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics

At date, one week, one month, and one year previous

For Early Delivery

Pig Iron, Per Gross Ton:	Oct. 31, 1922	Oct. 24, 1922	Oct. 3, 1922	Nov. 1, 1921
No. 2X, Philadelphia...	\$31.14	\$32.14	\$33.14	\$22.84
No. 2, Valley furnace...	30.00	31.00	33.00	21.00
No. 2, Southern, Cin'tit...	29.05	31.05	31.05	23.50
No. 2, Birmingham, Ala.†	25.00	27.00	27.00	19.00
No. 2 foundry, Chicago*	31.00	31.00	32.00	21.00
No. 2 foundry, eastern Pa.	28.50	29.50	29.50	20.50
Basic, Valley furnace...	30.00	30.00	33.50	19.00
Basic, Valley, del. Pitts...	34.77	34.77	35.77	21.96
Valley Bess, Chicago*	31.00	31.00	32.00	21.00
Malleable, Valley...	32.00	32.00	33.50	20.50
Gray forge, Pittsburgh...	31.27	32.27	34.27	21.96
U. S. charcoal, Chicago...	36.15	36.15	36.15	31.50
Ferromanganese, furnace...	100.00	100.00	**67.50	**60.00

Rails, Billets, etc., Per Gross Ton:

	Oct. 31, 1922	Oct. 24, 1922	Oct. 3, 1922	Nov. 1, 1921
O-h. rails, heavy, at mill.	\$43.00	\$43.00	\$43.00	\$40.00
Bess, billets, Pittsburgh...	40.00	40.00	40.00	29.00
O-h. billets, Pittsburgh...	40.00	40.00	40.00	29.00
O-h. sheet bars, P'gh...	39.00	40.00	40.00	30.00
Forging billets, base, P'gh	45.00	45.00	45.00	35.00
O-h. billets, Phila...	45.17	45.17	45.17	34.74
Wire rods, Pittsburgh...	45.00	45.00	45.00	40.00
	Cents	Cents	Cents	Cents
Skelp, gr. steel, P'gh, lb.	2.00	2.00	2.00	1.60
Light rails at mill...	2.00	2.00	2.25	1.65

Finished Iron and Steel,

Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Iron bars, Philadelphia...	2.325	2.325	2.475	1.95
Iron bars, Chicago...	2.50	2.50	2.50	1.75
Steel bars, Pittsburgh...	2.00	2.00	2.00	1.50
Steel bars, Chicago...	2.10	2.10	2.10	1.75
Steel bars, New York...	2.34	2.34	2.44	1.80
Tank plates, Pittsburgh...	2.00	2.00	2.25	1.60
Tank plates, Chicago...	2.30	2.30	2.30	1.75
Tank plates, New York...	2.34	2.34	2.49	1.88
Beams, Pittsburgh...	2.00	2.00	2.00	1.60
Beams, Chicago...	2.20	2.20	2.20	1.75
Beams, New York...	2.34	2.34	2.44	1.88
Steel hoops, Pittsburgh...	2.90	2.90	2.90	2.25

**C.I.F.

*The average switching charge for delivery to foundries in the Chicago district is 61c. per ton.

†Silicon, 1.75 to 2.25. ‡Silicon, 2.25 to 2.75.

The prices in the above table are for domestic delivery and do not necessarily apply to export business.

Sheets, Nails and Wire,	Oct. 31, 1922	Oct. 24, 1922	Oct. 3, 1922	Nov. 1, 1921
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Sheets, black, No. 28, P'gh	3.45	3.50	3.50	2.90
Sheets, galv., No. 28, P'gh	4.50	4.50	4.50	3.90
Sheets, blue an't'd, 9 & 10	2.60	2.60	2.60	2.25
Wire nails, Pittsburgh...	2.70	2.70	2.70	2.90
Plain wire, Pittsburgh...	2.45	2.45	2.45	2.60
Barbed wire, galv., P'gh...	3.35	3.35	3.35	3.55
Tin plate, 100-lb. box, P'gh	\$4.75	\$4.75	\$4.75	\$4.75

Old Material, Per Gross Ton:

	Oct. 31, 1922	Oct. 24, 1922	Oct. 3, 1922	Nov. 1, 1921
Carwheels, Chicago...	\$25.50	\$25.50	\$24.50	\$16.50
Carwheels, Philadelphia...	21.00	22.50	23.00	17.50
Heavy steel scrap, P'gh...	21.00	21.00	22.00	14.50
Heavy steel scrap, Phila...	17.00	17.50	18.50	12.00
Heavy steel scrap, Ch'go...	18.00	18.50	18.50	12.00
No. 1 cast, Pittsburgh...	24.00	24.00	24.00	17.50
No. 1 cast, Philadelphia...	22.00	22.00	23.00	17.50
No. 1 cast, Ch'go (net ton)	20.50	20.50	21.00	13.75
No. 1 RR. wrot, Phila...	21.00	22.00	23.00	16.00
No. 1 RR. wrot, Ch'go (net)	17.00	17.50	18.25	12.50

Coke, Connellsville,

Per Net Ton at Oven:

	Oct. 31, 1922	Oct. 24, 1922	Oct. 3, 1922	Nov. 1, 1921
Furnace coke, prompt...	\$7.50	\$8.50	\$12.00	\$3.10
Foundry coke, prompt...	10.00	10.50	13.00	4.25

Metals,

Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Lake copper, New York...	14.12½	14.12½	14.25	13.12½
Electrolytic copper, refinery	13.62½	13.62½	13.75	12.75
Zinc, St. Louis...	7.10	7.00	6.80	4.55
Zinc, New York...	7.45	7.35	7.15	5.05
Lead, St. Louis...	6.50	6.40	6.30	4.40
Lead, New York...	6.80	6.65	6.65	4.70
Tin (Straits), New York...	37.00	35.25	32.87½	28.00
Antimony (Asiatic), N. Y.	6.70	6.75	6.75	4.75

Composite Price, Oct. 31, 1922, Finished Steel, 2.446c. Per Lb.

Based on prices of steel bars, beams, tank plates, plain wire, open-hearth rails, black pipe and black sheets	Oct. 24, 1922, 2.467c. Oct. 3, 1922, 2.474c. Nov. 1, 1921, 2.163c. 10-year pre-war average, 1.689c.
These products constitute 88 per cent of the United States output of finished steel	

Composite Price, Oct. 31, 1922, Pig Iron, \$29.52 Per Gross Ton

Based on average of basic and foundry irons, the basic being Valley quotation, the foundry an average of Chicago, Philadelphia and Birmingham	Oct. 24, 1922, \$30.02 Oct. 3, 1922, 32.11 Nov. 1, 1921, 19.97 10-year pre-war average, 15.72
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is some demand and on which relatively better prices can be obtained.

The fact that there has been a recurrence of a shortage of cars, particularly of the box type, has again placed restrictions upon the movement of finished materials away from the mills, but it is without effect as a market factor because there has been no particular let down in steel production and buyers have the assurance that the supplies exist, even though full deliveries are not possible at the present time. Buyers also are in a hesitant mood because they see that the one big factor in the advance in prices, the high cost of fuel, is rapidly vanishing. Coke is down to \$7.50 per net ton at oven for beehive furnace grade or only slightly more than half the peak price reached prior to the settlement of the coal strike.

As to efficiency, labor still leaves much to be desired, but it is a fact the shortage is not as acute in a number of Pittsburgh district plants as it was a few weeks ago. More men are seeking work in the steel mills as the winter approaches.

There has been no special change in pig iron prices since a week ago, except that silveries have been reduced

\$2. The market is untested and lower prices seem likely with the appearance of a real inquiry. The scrap market has been featured by the purchase of approximately 60,000 tons of heavy melting steel at \$21, Pittsburgh, by an independent steel company which for some time has been out of the market. The transaction represents a decline in the price of \$2 per ton from the high point of a few weeks ago, but is likely to peg the market at that level, since some dealers sold short.

Pig Iron.—Business has been dull almost to the point of utter stagnation, melters being inclined to defer purchases until the actual needs exist, and with deliveries on old contracts at much lower prices than prevail to-day on a heavier scale than they were recently, needs are not so great as they have been. We reduce the price of foundry iron \$1 a ton to \$31, Valley furnace, for the base grade. Some iron of this grade, taking a rather high freight to point of consumption, has sold as low as \$30, Valley furnace, in competition with iron offering from other fields having a more favorable freight rate. In this district \$31, Valley furnace, and \$32, Johnstown, Pa., has been done on small lots of No. 2 foundry. Hardly enough has been done in other

grades to establish any change in prices. An Allegheny Valley sheet maker is a possible buyer of 5000 tons of basic iron in the next few weeks, and it is expected that this business will establish the real basis of that grade of iron, which is merely nominal at the current quotation of \$33, Valley, or Johnstown, Pa. W. P. Synder & Co. make the average price of Bessemer iron from Valley furnaces for the month of October at \$33.50, and for basic \$30, as compared with \$33.50 and \$32.93, respectively, for September.

We quote Valley furnace, the freight rate for delivery to the Cleveland or Pittsburgh district being \$1.77 per gross ton:

Basic	\$30.00
Bessemer	33.00
Gray forge	\$29.50 to 30.50
No. 2 foundry	30.00 to 31.00
No. 3 foundry	29.50 to 30.50
Malleable	32.00

Ferroalloys.—Demand here is light for all ferroalloys and quotations find almost no basis in sales. The price of \$100, furnace, recently announced on 80 per cent ferromanganese by domestic producers still is merely a quotation, and the price of British material being somewhat higher than that for the domestic offerings, it naturally does not find much appeal. Activity is unlikely until consumers have reduced their stocks. Interest in spiegeleisen and 50 per cent ferro-silicon is almost nil. Attractive orders for the former can be placed at less than quotations.

We quote 80 per cent ferromanganese at \$100, furnace, or \$104.79 to \$104.91 delivered Pittsburgh district for domestic and \$67.50 c.i.f. Atlantic seaboard, equal to \$105.89, duty paid, delivered, for British. Average 20 per cent spiegeleisen, \$38 furnace; 16 to 19 per cent, \$37; 50 per cent ferrosilicon, domestic, \$70 to \$75, delivered. Bessemer ferrosilicon is quoted f.o.b. Jackson and New Straitsville, Ohio, furnaces as follows: 10 per cent, \$48.50; 11 per cent, \$51.80; 12 per cent, \$55.10; 13 per cent, \$59.10; 14 per cent, \$62.10; silvery iron, 6 per cent, \$37; 7 per cent, \$38; 8 per cent, \$39.50; 9 per cent, \$43.50; 10 per cent, \$43.50; 11 per cent, \$46.80; 12 per cent, \$50.10. The present freight rate from Jackson and New Straitsville, Ohio, into the Pittsburgh district is \$3.66 per gross ton.

Wire Rods.—The leading interest is not much of a factor in the current market for the reason that it is considerably behind in its deliveries on old orders and is taking no new business. Its price is \$45 for the base size of soft rods to those customers it feels obligated to accommodate. Independents are looking out for regular customers at \$45, but are still obtaining \$47.50 for small tonnages for early delivery. Screw stock rods are slow, because users find coiled bars cheaper.

We quote No. 5 common basic or Bessemer rods to domestic consumers, \$45 to \$47.50; chain rods, \$45 to \$47.50; screw stock rods, \$50 to \$52.50; rivet and bolt rods and other rods of that character, \$45 to \$47.50; high carbon rods, \$52 to \$57.50, depending on carbon, per gross ton, f.o.b. Pittsburgh or Youngstown.

Billets, Sheet Bars and Slabs.—The market has a distinctly softer tone and it is probable that the next transactions of consequence will be at lower prices than have lately prevailed. Steel Corporation purchases, amounting to approximately 100,000 tons of ingots, sheet bars, billets and slabs, stayed the decline in prices, but with that company now showing little interest and with a number of producers having excess tonnages for sale, lower prices seem immediately ahead. While sheet bars have not yet sold at less than \$40, Pittsburgh or Youngstown, there are bona fide offers of tonnages at \$39, and sales of billets lately have been so difficult at \$40 as to lead to the belief that less could be done. Small lots of forging steel now are obtainable at \$45 and while some mills ask more, it is doubtful if more can now be obtained. Car shortages and a scarcity of labor are interfering with the outward movement of finished material but are not affecting the production of steel.

We quote 4 x 4-in. soft Bessemer and open-hearth billets, \$39 to \$40; 2 x 2-in. billets, \$40; Bessemer sheet bars, \$39 to \$40; open-hearth sheet bars, \$39 to \$40; slabs, \$39 to \$40; forging billets, ordinary carbons, \$45, all f.o.b. Pittsburgh or Youngstown mills.

Wire Products.—The sold up condition of the leading interest makes for heavier demands upon the independent manufacturers than otherwise might be the case. Little activity is observed in barbed wire or in fence, but other wire products, notably nails, are in demand for delivery over the remainder of this year. Jobbers' stocks are good in some places, but light in

others; the explanation is found in an uneven supply of cars, or irregular shipping conditions on the railroads in the different parts of the country. We note no shading of quotations. Prices are given on page 1175.

Iron and Steel Bars.—The market on soft steel bars has pretty definitely settled to a flat price of 2c. base, Pittsburgh, and it is currently reported that in the Cleveland district a price equivalent to 1.95c., Pittsburgh, has been named by some mills having a freight advantage to that point. The full range of prices on known business, however, still is 2c. to 2.10c., base, Pittsburgh, as there have been sales of carload lots for early delivery at the higher figure. We make no change in iron bars, but makers note the lighter demand that there was recently.

We quote steel bars rolled from billets at 2c. to 2.10c.; reinforcing bars, rolled from billets, 2c. to 2.10c. base; rail steel reinforcing bars, 1.90c. to 2c.; refined iron bars, 2.60c. in carloads, f.o.b. mill, Pittsburgh.

Plates.—Sales of sizable tonnages at more than 2c. now are almost out of the question. Where a variety of sizes and gages is demanded and early delivery is essential, premiums are obtainable but not so readily as they could be a few weeks ago. Buyers are getting too much low priced tonnage to be seriously interested in the market at present prices, especially as new jobs involving the use of plates no longer are numerous. Prices are given on page 1175.

Rivets.—Agricultural implement manufacturers are providing little or no business for rivet makers, but other consuming industries are reported to be specifying steadily against contracts. There is still a range of prices here, some makers quoting large rivets at \$3 and \$3.10, base, and small rivets at 65 and 5 per cent off list or \$3 a ton below the prices of the larger producers. Current shipments carry prices which average well below the quotations given on page 1175.

Steel Skelp.—Any real scarcity of this product that existed has been pretty well relieved and no difficulty now attends placing orders at 2c. for either grooved or sheared pipe skelp. Occasional sales of boiler tube skelp for quick shipment command a slight premium.

Sheets.—The market appears to be definitely weaker on black sheets, but is holding up well on other finishes. Some of the independent makers who did not accumulate a very big backlog of black sheets, lately have found it necessary to go as low as 3.35c., base, to get orders. That is the Steel Corporation base on black sheets, but it has not lately been accepting business at this or any other price for delivery this year. The going prices on galvanized sheets are 4.50c. to 4.60c., base, and there are still sales of blue annealed sheets as high as 2.75c., base. Shipping conditions with the mills in all parts of this and nearby districts are bad on account of car shortages, which promise to be worse instead of better in the immediate future, since an order of the American Railway Association, dated Oct. 26, having the authority of the Interstate Commerce Commission, directs the immediate return West of box cars of Western roads now on Eastern lines. The order says that cars going West from Pittsburgh, Youngstown and Wheeling may be loaded for points West of Chicago, Peoria and St. Louis, but not to points east of those centers. The use of Western cars for shipments East is prohibited. The Republic Iron & Steel Co. has been forced to shut down eight mills of its Niles, Ohio, sheet plant because of the car shortages, but operations of independents generally are above 80 per cent. The leading interest has further increased its operations and now is operating more than 60 per cent of its sheet mills. Prices are given on page 1175.

Tin Plate.—Makers are besieged with inquiries for tonnages for delivery over the remainder of the year, but are not accepting many because they set the price at \$4.75 per base box, Pittsburgh, and that, it is claimed, is below costs. Assuming full operations and a price of about \$35 for sheet bars, makers could sell at the current price and not lose money. But it is figured that the labor supply will not permit anywhere nearly full operations for some time and a drop to \$35 for sheet bars is not believed to be immediately ahead. Under the circumstances, it is no surprise that

the prediction is common that the first quarter of 1923 price will be at least \$5 per base box. The leading interest has all the business it can handle for the remainder of the year and is out of the market.

Cold-Finished Steel Bars and Shafting.—We make no change in prices, the market showing no important deviation on new business from 2.50c., base, Pittsburgh, for carload lots of drawn, rolled or turned bars, while 2.90c. base, f.o.b. mill for carloads still is observed on ground shafting. Makers still have considerable business on their books carrying lower prices and buyers are specifying on such orders to a larger extent than they are buying. New demands are largely for piecing out or for sizes that are wanted in a hurry.

Track Fastenings.—There is no change in the general situation. New buying is on a moderate scale, but the railroads are specifying steadily and as the makers have good-sized bookings, they are not at present so eager for additional orders as to consider lower prices. Little of the business now on the books is at present quotations. Prices are given on page 1175.

Hot-Rolled Flats.—On wide strips for immediate delivery, the common base is 3c., Pittsburgh, but on hoops and bands, the going price is 2.90c. and that price is not easily obtained since most users have good-sized orders in with the mills at lower prices and are inclined to wait on deliveries rather than make new purchases. Prices are given on page 1175.

Cold-Rolled Strips.—While the demand is good for the time of year and in view of the lighter operations of the automotive industry, the urgency of buyers for supplies is less than it was recently and there is more of a disposition to wait delivery on old and lower-priced orders than to make new purchases. Prices are given on page 1175.

Bolts and Nuts.—Buyers are specifying fairly well against orders placed prior to the last advance in prices. New business is light and quotations do not indicate much basis in sales. Discounts are given on page 1175.

Structural Material.—The market is soft. The regular quotation is 2c., Pittsburgh, and occasionally a small tonnage for very prompt delivery commands a little more, but fabricating interests now are getting deliveries against contracted tonnages placed much below to-day's prices, and these supplies generally are sufficient to take care of current structural business, which for the most part is for small tonnages. The existence of this low priced steel is reflected in very low business against structural inquiries. It is said that bids based upon plain material at more than 1.70c. do not stand much chance of fetching awards. The trade looks for a good spring business in housing and commercial construction, but it is figured that another year or two must elapse before the country catches up with war time expansion of industrial building. Plain material prices are given on page 1175.

Steel Rails.—A strong effort is observed to maintain a price of 2.25c., base, for light rails rolled from new steel, but it is not especially successful and such business as has been done at that price has been for moderate lots out of stock. On strictly mill business the market appears quotable from 2c. to 2.15c., base, while these sections rolled from old rails are priced at 2c., base.

We quote 25 to 45-lb. sections, rolled from new steel, 2c. to 2.25c. base; rolled from old rails, 1.90c. to 2c. base; standard rails, \$43 per gross ton mill for Bessemer and open-hearth sections.

Iron and Steel Pipe.—While demand for a number of finished products admittedly is slower, this is not the case with pipe. Standard pipe still is in strong demand and interest in oil country goods and line pipe is said to be increasing. It is thought, however, that the activity is partly due to the fact that distributors are specifying in excess of their real needs to secure advantage of the prices in effect prior to Oct. 19. Few makers had caught up with old standard pipe obligations at lower prices when the last advance was announced. Plant operations are high, but car shortages limit shipments and a good deal of the current production is being piled. Wrought iron pipe is in fair demand, but specifications on old business exceed new orders. A. M. Byers Co. have made an advance of one

point or \$2 a ton on less than carload lots of wrought iron pipe. The spread between carload and less carload discounts now is a matter of nine to 13 points. Discounts are given on page 1175.

Boiler Tubes.—Demand still is reported to be heavy and makers still are behind several weeks on their orders. The advance in welded boiler tubes by the National Tube Co. was accompanied by a similar advance in commercial seamless tubes, while locomotive and superheater tubes were advanced $\frac{3}{4}$ c. to 2c. per ft. Independent makers of seamless tubes have adopted the new schedule which, however, does not change the discount on mechanical tubing. Discounts are given on page 1175.

Coal and Coke.—A further decline of \$1.50 per ton has been registered in the price of beehive oven furnace coke since a week ago, because an increase in production has not been accompanied by a like gain in consumption and sellers have been more numerous than buyers. The current market is quotable from \$7.50 to \$8.50 per net ton at oven, with the bulk of the recent business at \$7.50 to \$8, and some contracts for the remainder of the year have been made at the latter price. The market also is easier on foundry grades, but the decline is much less than that in furnace grade because the labor situation has not yet cleared up sufficiently in the Connellsville district to permit many of the oven operators to grade up the 72-hr. fuel. The market is quotable at \$10 to \$11 per net ton, oven, or 50c. to \$1 below the prices of a week ago. The coal market is slightly firmer than it has been because of the difficulty of securing sufficient cars. The trouble in western Pennsylvania is not that there are any fewer cars but that the available supply has to be distributed over a greater number of operations than ordinarily is the case. If prices come down, a good many of the mines now working will be forced to quit and this would insure larger placements for the mines which can operate profitably at lower prices. We quote steam coal mine run grade at from \$3.25 to \$3.50 per net ton at mines; by-product coal at \$3.50 to \$4; and gas coal at \$4.25 to \$4.50 for mine run, and \$5 to \$5.50 for lump.

Old Material.—An independent steel maker, out of the market for several weeks, came in late last week and has taken in all close to 60,000 tons of heavy melting steel at \$21, Pittsburgh. This business establishes the market here on that grade at that price, a concession of from 50c. to \$1 per ton below what dealers hitherto have been asking for heavy melting steel delivered Pittsburgh. The sale probably will stay the downward tendency of prices recently observed, but it seems doubtful whether it will bring about an advance for the reason that it fixes a limit that will be paid for Pittsburgh delivery on this grade. There is some surprise that a price this low was done in view of the fact that lately a relatively better price has been obtainable in Youngstown and Canton. Sellers in some cases, however, own much of what they sold and the railroad lists are fairly heavy this month, the Pennsylvania Railroad offering about 35,000 net tons off its Eastern and Central regions.

We quote for delivery to consumers' mills in the Pittsburgh and other districts taking the Pittsburgh freight rate as follows:

Per Gross Ton	
Heavy melting steel.....	\$21.00
No. 1 cast, cupola size.....	24.00 to 25.00
Rails for rolling, Newark and Cambridge, Ohio; Cumberland, Md.; Huntington, W. Va.; Franklin and Williamsport, Pa.	22.00 to 22.50
Compressed sheet steel.....	19.50 to 20.00
Bundled sheet sides and ends....	17.00 to 17.50
Railroad knuckles and couplers...	24.50 to 25.00
Railroad coil and leaf springs...	24.50 to 25.00
Low phosphorus standard bloom and billet ends.....	25.00 to 26.00
Low phosphorus, plates and other grades	24.00 to 25.00
Railroad malleable	22.00 to 22.50
Iron car axles.....	30.00 to 32.00
Locomotive axles, steel.....	27.00 to 28.00
Steel car axles.....	24.00 to 25.00
Cast iron wheels.....	25.25 to 25.75
Rolled steel wheels.....	24.50 to 25.00
Machine shop turnings.....	16.50 to 17.00
Heavy steel axle turnings.....	18.00 to 18.50
Short shovelling turnings.....	18.00 to 18.50
Cast iron borings.....	18.50 to 19.00
Heavy breakable cast.....	20.00 to 20.50
Stove plate	17.50 to 18.00
Sheet bar crop ends.....	24.00 to 25.00
No. 1 railroad wrought.....	20.00 to 20.50

Chicago

Increased Buying by Railroads—Other Demand Not So Active

CHICAGO, Oct. 31.—All indications point to increased buying by the railroads, but demand from other sources is less active. The disposition of the average buyer is to await developments evidently on the theory that prices will not go any higher and may, in fact, decline. The position of the mills, however, is strong and the placing of additional car steel will give them an even larger backlog. Pending inquiries, principally from Western roads, call for over 45,000 freight cars and nearly 700 passenger cars, probably the largest number of cars ever in the market at one time. Fully 450,000 tons of steel is involved, all of which will have to be placed for 1923 delivery, in view of present business on the books of both car builders and mills.

Local mill prices are unchanged. The leading interest continues to quote 2c., Chicago, on soft steel bars and 2.10c., Chicago, on structural shapes and plates. While it is taking orders with specification attached for delivery at convenience, it is accepting no contracts. The foremost independent is asking 2.10c., 2.20c. and 2.30c., Chicago, for bars, shapes and plates respectively, but has little remaining tonnages open for this year and has not yet opened its books for first quarter. For a prominent interest sales and specifications last week were slightly heavier than the average for the past three months.

Demand from the automotive industry is showing unusual buoyancy. In past years, purchases of material by automobile plants have dropped sharply with the passing of the summer season, but this has not been true this fall. While it is undeniable that automobile production is declining, the decline is surprisingly small, particularly for certain manufacturers. The leading maker of low priced cars produced 925,325 during the first nine months of this year and expects to make a total of 1,300,000 for the full year.

The transportation situation has improved sufficiently to permit an increase in iron and steel production. The Illinois Steel Co. has added a furnace at South Works, giving it a total of 16 active stacks out of its 29, and at the same time has increased its steel output to 73 per cent of ingot capacity. The Wisconsin Steel Co. has put in a second blast furnace. One Bay View furnace at Milwaukee, which has recently banked, has resumed operation. Production at the Inland Steel Co. is unchanged with all three blast furnaces in and steel output at 65 to 70 per cent of capacity. The question uppermost in the minds of producers is whether these gains can be held after the arrival of severe weather. No plants have been able to set aside fuel reserves, and as the railroads are now having difficulty in delivering the local requirements of the steel industry, which average from 450 to 500 cars a day, there seems to be little hope of their bringing in the necessary supply when they are crippled by winter conditions.

Pig Iron.—Extreme caution characterizes the attitude of buyers. There is little inquiry for first quarter and purchases for the remainder of the year are few. Spot iron alone is in demand and even it is not moving as fast as heretofore. Prices of Northern iron still seem well established at \$31 base furnace, although some re-sale material has appeared of late. Apparently some melters who bought at bottom prices now desire to sell to realize the profit. On the other hand, a considerable proportion of users have little stock on hand and are pressing the furnaces for deliveries against previous orders. It is for this reason and also because foundries appear to be generally busy that sellers regard the potential demand as good. Among the few sales which have been made for first quarter shipment is one of 600 tons of foundry to a Michigan melter. A northern Illinois agricultural implement maker has closed for 300 tons of foundry for prompt shipment. An Indiana melter is in the market for 1500 tons of foundry for the rest of the year, and a local railroad

equipment manufacturer wants 500 tons of foundry for the same delivery. Transportation difficulties still impede sales of Southern iron in this territory. A number of carload lots, however, have been sold here at \$25 and \$27 base Birmingham, respectively, and a sale of re-sale material for Milwaukee delivery was made at a still lower figure. Silvery has dropped \$2 a ton, while Bessemer ferrosilicon is very weak owing to Canadian competition. A Michigan automobile maker has closed for 1500 tons of 14 to 16 per cent at approximately \$44.50, delivered. Foreign competition has again been felt in the low phosphorous market. A sale of 100 tons of this material with a slight trace of copper has been made at approximately \$38 delivered, Chicago.

Quotations on Northern foundry, high phosphorous malleable and basic irons are f.o.b. local furnace and do not include an average switching charge of 61¢ per ton. Other prices are for iron delivered at consumers' yards, or when so indicated, f.o.b. furnace other than local.

Lake Superior charcoal, averaging sil. 1.50, delivered at Chicago	
Northern coke, No. 1, sil. 2.25 to 2.75	\$36.15
Northern coke, foundry, No. 2, sil. 1.75 to 2.25	32.00
Northern high phos.	31.00
Southern No. 2.	\$31.00 to 32.00
Malleable, not over 2.25 sil.	31.00
Basic	31.00
Low phos., Valley furnace, sil. 1 to 2 per cent copper free.	38.00
Silvery, sil. 8 per cent.	44.29

Ferroalloys.—Spiegeleisen is slightly weaker, being available at \$47 delivered. Ferromanganese is quiet, but two recent carload sales were made at the full price.

We quote 80 per cent ferromanganese, \$108.66, delivered; 50 per cent ferrosilicon, \$65 delivered (nominal); spiegeleisen, 18 to 22 per cent, \$47, delivered.

Plates.—Pending inquiries call for 45,263 freight cars and 689 passenger cars, principally for western roads. This is believed to be the largest number of cars which has ever been in the market at one time. Fully 450,000 tons of steel is involved which, in due time, will be booked by the mills. In contrast with the large prospective demand for plates from carbuilders, inquiry from other sources is less active. The leading interest continues to take orders with specifications attached for delivery at convenience, but is accepting no contracts. The foremost independent is still in a position to take limited tonnages at 2.30c., Chicago, for late December delivery, but has not opened its books for first quarter.

The mill quotation is 2.10c. to 2.30c., Chicago. Jobbers quote 2.90c. for plates out of stock.

Bars.—Carbuilders and railroads are still conspicuous as buyers of mild steel bars. Demand from the automotive industry is also holding up surprisingly well. There has been no material decline in buying with the passing of the summer season as was the case in past years. New business from other sources is lighter. The condition of the farm implement manufacturers is still discouraging, but the few changes in operation which have been reported are in the direction of improvement. Demand for bar iron is still of small volume. The principal effect of the closing down of one important mill was to increase the share of remaining producers in the tonnage which is being placed. Prices remain unchanged. Hard steel bar mills are booking considerable tonnage well distributed among farm implement makers, bedstead manufacturers, fence post makers and reinforced concrete builders. New demand is not so heavy, but producers have comfortable backlogs. The ruling quotation is 2c., mill.

Mill prices are: Mild steel bars, 2c. to 2.10c., Chicago; common bar iron, 2.50c., Chicago; rail steel, 2c., Chicago mill.

Jobbers quote 2.80c. for steel bars out of warehouse. The warehouse quotation on cold-rolled steel bars and shafting is 3.80c. for rounds and 4.30c. for flats, squares and hexagons.

Jobbers quote hard and medium deformed steel bars at 2.50c. base; hoops, 4.15c.; bands, 3.55c.

Wire Products.—Mill operations show no improvement and in other respects the market situation is unchanged. Jobbers and other users are still pressing

for deliveries, indicating that material is passing rapidly into consumption and that no stocks have been accumulated. For mill prices see finished iron and steel, f.o.b. Pittsburgh, page 1175.

We quote warehouse prices f.o.b. Chicago: No. 9 and heavier black annealed wire and No. 9 and heavier bright basic wire, \$3.30 per 100 lb.; common wire nails, \$3.45 per 100 lb.; cement coated nails, \$2.90 per keg.

Rails and Track Supplies.—Current orders for track supplies are small, as to be expected after the heavy buying of a month ago. Demand for light rails has fallen off sharply.

Standard Bessemer and open-hearth rails, \$43; light rails rolled from new steel, 2.15c., f.o.b. makers' mills.

Standard railroad spikes, 2.85c. to 3c., mill; track bolts with square nuts, 3.85c. to 4c., mill; iron tie plates, 2.50c.; steel tie plates, 2.35c., f.o.b. mill; angle bars, 2.75c., f.o.b. mill.

Jobbers quote standard spikes out of warehouse at 35c. base and track bolts 45c. base.

Bolts and Nuts.—Specifications are lighter, although most bolt and nut plants have enough business now on their books to insure good operations for some time to come. While a few automobile manufacturers continue to maintain high rates of production, the output of cars generally is declining and purchases of bolts and nuts are being reduced accordingly. The September discounts are still being quoted by important sellers and it is doubtful whether any business of consequence is being placed at higher prices.

Jobbers quote structural rivets, 5.75c.; boiler rivets, 3.85c.; machine bolts up to $\frac{3}{4}$ x 4 in., 50 per cent off; larger sizes, 50 off; carriage bolts up to $\frac{3}{4}$ x 6 in., 45 off; larger sizes, 45 off; hot pressed nuts, squares and hexagons, tapped, \$2.75 off; blank nuts, \$2.75 off; coach or lag screws, gimlet points, square heads, 55 per cent off.

Sheets.—With deliveries from local mills steadily improving, buyers are showing less interest in premium material and it is doubtful whether any tonnage of consequence is now being placed at more than what have been heretofore the minimum prices, namely 2.50c., base Pittsburgh, for blue annealed, 3.35c. for black and 4.35c. for galvanized.

Mill quotations are 3.35c. for No. 28 black, 2.50c. for No. 10 blue annealed and 4.35c. for No. 28 galvanized, all being Pittsburgh prices, subject to a freight rate to Chicago of 34c. per 100 lb.

Jobbers quote f.o.b. Chicago, 4c. for blue annealed, 4.85c. for black and 5.85c. for galvanized.

Reinforcing Bars.—Lettings of concrete bars have been fairly numerous of late and have involved good-sized individual tonnages, but new projects are noticeably fewer and competition for pending business has grown keener. While the warehouse price of 2.50c. is holding firmly for small tonnages, attractive projects are bringing out concessions. Recent awards include:

Judson Hotel building, Chicago, 200 tons, to Barton Spiderweb Co.

Northern Bank Note Co. building, Chicago, 250 tons, to Truscon Steel Co.

Sheridan Beach Hotel building, Chicago, 250 tons, to Truscon Steel Co.

High school building, St. Paul, Minn., 400 tons, to Cowin & Co., St. Paul.

Waterworks, Memphis, Tenn., 450 tons, to Truscon Steel Co., 250 tons to Laclede Steel Co.

United States Aeronautical Service, building, Broadview, near Chicago, 100 tons, to Barton Spiderweb Co.

Pending projects include:

Illinois State Highway Commission, letting of general contract, 100 miles of roads with bridges, Oct. 31, 1200 tons.

Central Mfg. District, plant building, Chicago, E. W. Spruiell Co., Chicago, general contractor, 1000 tons.

Hayes Hotel, building, Chicago, general contract to Charles D. Johnson, Chicago, 200 tons.

Hotel for LeRue Poppenfus, Chicago, 400 tons.

First Avenue Bridge, Sterling, Ill., 240 tons.

Veterans' Hospital, Camp Sherman, Chillicothe, Ohio, 800 to 1000 tons of billet stock.

Railway Brotherhood Building, Cincinnati, 440 tons.

Steel Castings.—Car builders continue to place the miscellaneous castings for cars recently booked. For 3500 Santa Fe cars 2000 tons of castings have been placed. With much business pending and in prospect, steel foundries look for a busy winter.

Structural Material.—Fabricating awards are more numerous than a week ago and one of them, the Chicago Allerton House, calls for 2400 tons. On the whole, however, the trend is downward in construction work, new contracts being fewer and smaller. Most shops have enough work on the books to carry them through the winter. Prices of plain material remain unchanged.

The mill quotation on plain material is 2.10c. to 2.20c., Chicago. Jobbers quote 2.90c. for plain material out of warehouse.

Cast Iron Pipe.—Although shipments from pipe shops continue to improve, new demand is light. Pleasant Ridge, Mich., is taking bids on 400 tons of 10 and 12-in., while Warren, Ohio, receives tenders today on 225 tons of 6 and 8-in. Nokomis, Ill., opens bids Nov. 2 on 160 tons of 8 and 6-in. While orders from municipalities are few, private buying is improved, one good sized purchase being reported.

We quote per net ton, f.o.b. Chicago, as follows: Water pipe, 4-in., \$55.20 to \$57.20; 6-in. and above, \$51.20 to \$53.20; class A and gas pipe, \$3 extra.

Old Material.—The market is generally softer and various grades have declined from 50c. to \$1 a ton. Shipments from the railroads are much improved, better than they have been for months, and new railroad offerings are more liberal. With deliveries of scrap improved, users are showing less concern about their future supplies and most of the larger buyers are now out of the market. This is particularly true of the steel works which have contracted for heavy tonnages and are now awaiting shipments. Iron mill grades are still dull because of low production of bar iron. Buying of cast and malleable grades is confined largely to the small foundries. The appearance of lower prices has caused many holders of scrap to release material in the hope of liquidating before the market drops further. While this has tended to increase the current available supply of scrap, there is little expectation among either sellers or users of a sustained downswing in prices. Railroad lists include the Pennsylvania, Northwestern Region, 3000 tons; the Pennsylvania, Southwestern Region, 3500 tons, and the Burlington, 2500 tons.

We quote delivery in consumers' yards, Chicago and vicinity, all freight and transfer charges paid, as follows:

Per Gross Ton	
Iron rails	\$24.50 to \$25.00
Cast iron car wheels	25.50 to 26.00
Relaying rails	27.50 to 32.50
Rolled or forged steel car wheels	22.50 to 23.00
Rails for rolling	19.50 to 20.00
Steel rails, less than 3 ft.	21.00 to 21.50
Heavy melting steel	18.00 to 18.50
Frogs, switches and guards cut apart	18.00 to 18.50
Shoveling steel	17.75 to 18.25
Drop forge flashings	12.00 to 12.50
Hydraulic compressed sheet	15.50 to 16.00
Axle turnings	15.50 to 16.00

Per Net Ton	
Iron angles and splice bars	23.00 to 23.50
Steel angle bars	18.00 to 18.50
Iron arch bars and transoms	22.50 to 23.00
Iron car axles	26.00 to 26.50
Steel car axles	19.00 to 19.50
No. 1 busheling	15.00 to 15.50
No. 2 busheling	10.00 to 10.50
Cut forge	16.00 to 16.50
Pipe and flues	12.00 to 12.50
No. 1 railroad wrought	17.00 to 17.50
No. 2 railroad wrought	16.00 to 16.50
Steel knuckles and couplers	20.00 to 20.50
Coil springs	21.50 to 22.00
No. 1 machinery cast	20.50 to 21.00
No. 1 railroad cast	19.50 to 20.00
Low phosph. punchings	17.50 to 18.00
Locomotive tires, smooth	18.00 to 18.50
Machine shop turnings	11.00 to 11.50
Cast borings	13.50 to 14.00
Stove plate	17.50 to 18.00
Grate bars	17.00 to 17.50
Brake shoes	17.00 to 17.50
Railroad malleable	21.50 to 22.00
Agricultural malleable	21.50 to 22.00

Reorganization of the John R. Squire Co., Youngstown, Ohio, a sheet metal interest, has been effected since its purchase by the Dalzell Bros. Co., engaged in heavy sheet metal work, roofing and heating and ventilating installations. The two companies will continue as separate entities. The John R. Squire Co. will devote its activities largely to warm air furnace installations. The concerns jointly employ 150 men.

New York

Good Demand for Concrete Bars—Pig Iron Dull—Coke Prices Lower

NEW YORK, Oct. 31.—It is plain that buyers are convinced that prices of pig iron will not be higher in the near future and they see some reason for believing that there will be further recessions. Hence, buying is very light and is confined to limited tonnages for prompt delivery. That buyers would not come into the market for any considerable tonnages if prices were sharply reduced is shown by the slowness in which some resale iron is being placed. Current reports indicate that \$28 has been done in Buffalo on resale iron, but \$29.50 continues to be the usual furnace quotation, while in eastern Pennsylvania \$30 is regarded as the base, but it is conceded that a lower price would be named on an attractive tonnage. Contracting by importers for foreign iron seems to have come to an end and arrivals of foreign iron in the United States are decreasing. Foreign quotations are fairly firm at about \$29.50 for Scotch and \$27 to \$28 for Continental, with larger concessions than heretofore on high phosphorus iron. Furnaces still report much difficulty in making deliveries, owing to numerous embargoes declared by the railroads.

We quote delivered in the New York district as follows, having added to furnace prices \$2.27 freight from eastern Pennsylvania, \$4.91 from Buffalo and \$5.44 from Virginia:

East. Pa. No. 1 fdy., sil. 2.75 to 3.25.....	\$34.27
East. Pa. No. 2X fdy., sil. 2.25 to 2.75.....	33.27
East. Pa. No. 2 fdy., sil. 1.75 to 2.25.....	32.27
Buffalo, sil. 1.75 to 2.25.....	34.41
No. 2 Virginia, sil. 1.75 to 2.25.....	No sales

Ferroalloys.—Demand for ferromanganese is confined to a few carload lots for early delivery, and this is being met by British producers almost entirely at the regular quotation at \$67.50, c.i.f. With the exception of a few lots the domestic alloy is not in evidence, but on future business it is understood that such producers are quoting \$100, furnace. The spiegeleisen market is very quiet, with demand confined to carload lots at prevailing quotations. Specifications on contracts for 50 per cent ferrosilicon continue very heavy and some consumers have entered the market for carload lots for early delivery at as high as \$75, delivered. Quotations are as follows:

Ferromanganese, domestic, furnace, nominal, per ton.....	\$100.00
Ferromanganese, British, c.i.f., per ton.....	\$67.50
Spiegeleisen, 17 to 19 per cent, furnace.....	\$38.00
Spiegeleisen, 20 per cent, furnace or duty paid.....	\$38.00 to \$39.00
Ferrosilicon, 50 per cent, delivered, per gross ton, carloads.....	\$75.00
Ferrotungsten, per lb. of contained metal, 70c. to 85c.	
Ferrochromium, 4 to 8 per cent carbon, 60 to 70 per cent Cr., per lb. Cr., delivered.....	12c. to 14c.
Ferrovandium, per lb. of contained vanadium.....	\$3.50 to \$4.00
Ferrocobaltititanium, 15 to 18 per cent, in carloads, per net ton.....	\$200.00
Ores	
Manganese ore, foreign, per unit, c.i.f. 29c. to 30c.	
Tungsten ore, per unit, in 60 per cent concentrates, nominal.....	\$7.50 to \$7.75
Chrome ore, basis 48 per cent Cr ₂ O ₃ , crude, per ton, c.i.f. Atlantic seaboard.....	\$18.00 to \$25.00
Molybdenum ore, 85 per cent concentrates, per lb. of MoS ₂ , New York.....	55c. to 60c.

Cast-Iron Pipe.—Private purchasing still shows considerable strength, particularly for the season, makers continuing booked up to the end of the year. Municipal tenders still appear at intervals. The latest, calling for 450 tons of 16-in. and 12-in. high pressure water pipe for the city of Boston, closed Oct. 30. We quote per net ton, f.o.b. New York, in carload lots, as follows: 6-in. and larger \$54.50; 4-in. and 5-in., \$59; 3-in., \$64.80, with \$4 additional for Class A and gas pipe. The soil pipe market is unchanged. We quote per net ton, delivered New York, discounts of both Southern and Northern makers, as follows: 2 to 6-in. standard, 25 to 30 per cent off list; heavy, 34 and 35 per cent off list.

Warehouse Business.—The market continues active and October is believed to have been quite as satisfactory a month as September. Prices generally are unchanged. Sheets still show weakness, despite the fact that some warehouses complain that they meet with

difficulty in obtaining shipments from mills. While the prevailing quotations are 4.50c. to 4.90c. per lb. on No. 28-gage black and 5.50c. to 5.90c. per lb. on No. 28-gage galvanized, some shading is reported. A few dealers are said to be willing to concede 5c. to 10c. per 100 lb. on any order larger than ordinary. Dealers handling tire steel report a distinct shortage, evidenced by the number of orders being received by them from other dealers outside of this district to fill in on sizes. This condition is also true of spring steel, in which transactions are numerous between dealers to fill in sizes for their stock. Warehouses handling wrought iron and steel pipe report business still active and attribute the present activity partly to the building construction that is being carried on late into the fall. Wrought iron pipe is dull in comparison to the activity in steel, and dealers point to the fact that the price on wrought iron pipe is about 100 per cent higher than the quotations for steel pipe. Brass and copper warehouses report no change since Sept. 28. Business continues fair. We quote prices on page 1196.

High Speed Steel.—The market is dull and prices continue unchanged. Producers generally quote from 75c. to 80c. per lb. on 18 per cent tungsten high speed steel, with special brands of some companies ranging up to 95c. per lb.

Finished Iron and Steel.—There has been a gradual let-up in steel buying in recent weeks, the past week having brought out a smaller volume of business than those just preceding it. Sellers do not wholly attribute the slump in demand to the easier price situation, but the fact remains that except for specific jobs which have been planned to go ahead at this time buyers of steel are covering their requirements only in a small way and are not anticipating their needs for more than two or three weeks at a time. The general explanation for the present light volume of buying is that consumers covered pretty well for fourth quarter are depending on shipments on their contracts, which are now coming through quite freely considering the transportation embargoes. Plates, shapes and bars are generally quoted at 2c., Pittsburgh, but on plates this price is admittedly not strong, and on large tonnages of car plates or oil tank steel, for example, it is intimated that one or two mills would be willing to quote 1.95c., Pittsburgh, and some buyers report that they have already received such quotations for fairly prompt shipment. Reports of sales of concrete reinforcing bars at 1.95c., Pittsburgh, are unconfirmed. Shapes appear to be fairly firm at 2c. The premium prices on sheets have almost entirely disappeared, and it is possible to buy for early delivery at the prices named by the American Sheet & Tin Plate Co. A large order for wire mesh, about 2600 tons, for the Tulsa water works, has been placed with the American Steel & Wire Co. Demand for structural steel is falling off, but three pending jobs call for a total of about 6000 tons. Up to Sept. 30 about 110,000 tons of steel had been required for buildings erected or under construction in the metropolitan district, this not including bridges, subway or elevated work. There is a fairly good demand for concrete reinforcing bars. The following are some of the jobs now being figured on:

Walker Hotel, Washington, D. C., 1000 tons.
Terminal Refrigerating Warehouse Co., Washington, D. C., 800 tons.
Chevrolet Motor Car Co. plant at Buffalo, 1000 tons.
Collingwood school, Cleveland, 500 tons.

Other jobs, including one of 8000 tons, make up a further total of upward of 10,000 tons. The following bar contracts have been awarded:

Transportation Building, Washington, D. C., 480 tons, to Rosslyn Steel & Supply Co.
Road work in Missouri, 200 tons, to Concrete Steel Co.
Pillsbury flour mills, Buffalo, 1000 tons, to Corrugated Bar Co.

We quote for mill shipments, New York delivery, as follows: Soft steel bars, structural shapes and steel plates, 2.34c.; bar iron, 2.34c.

Coal and Coke.—The coke market continues to soften and furnace grades can now be had from \$7.75 to \$8.25 for even small lots, while considerably lower prices are

named on coke of moderately high sulphur. In foundry grades usual quotations range from \$10 to \$12, but one important company has closed contracts with its consumers of Virginia foundry coke at \$8 for first half of 1923. On by-product coke, long quoted at \$14, seaboard, quotations are now being made on the delivered basis of \$14.91, delivered Newark and Jersey City points. This represents a substantial reduction for most consumers.

Old Material.—The general weakness continues. Bethlehem has suspended purchasing and because of congestion at the Alan Wood Iron & Steel Co. works some shippers are delaying shipment on contracts. Heavy melting steel is still quotable at \$13.50 to \$14 per ton, although most of the transactions are evidently nearer to the low price than the high. Specification pipe is extremely quiet, Lebanon no longer buying, even at \$15. The stove plate market is also dull, a Harrisburg mill only showing interest in purchasing at its own figure and a Phoenixville mill paying \$16.50 delivered, which with a \$3.53 freight rate figures back to \$13.22 per ton, New York. Machine shop turnings and mixed borings and turnings are weaker and can not be quoted at better than \$11 to \$12. One broker reports shipments to Johnstown at \$15.25, which would amount to \$10.46 per ton New York. Other transactions, such as \$15.50 Bethlehem, however, are reported, which justify the higher quotation.

Buying prices per gross ton, New York, follow:

Heavy melting steel, yard.....	\$13.50 to \$14.00
Steel rails, short lengths, or equivalent.....	14.25 to 14.75
Rails for rolling.....	16.50 to 17.50
Relaying rails, nominal.....	27.00 to 28.00
Steel car axles.....	No market
Iron car axles.....	23.00 to 24.00
No. 1 railroad wrought.....	16.00 to 16.50
Wrought iron track.....	14.50 to 15.00
Forge fire.....	11.00 to 11.50
No. 1 yard wrought, long.....	13.50 to 14.00
Cast borings (clean).....	12.50 to 13.00
Machine-shop turnings.....	11.00 to 12.00
Mixed borings and turnings.....	11.00 to 12.00
Iron and steel pipe (1 in. diam., not under 2 ft. long).....	11.00 to 11.50
Stove plate.....	13.25 to 13.75
Locomotive grate bars.....	14.00 to 14.50
Malleable cast (railroad).....	13.50 to 14.00
Cast-iron car wheels.....	14.50 to 15.00

Prices which dealers in New York and Brooklyn are quoting to local foundries, per gross ton, follow:

No. 1 machinery cast.....	\$20.00 to \$21.00
No. 1 heavy cast (columns, building materials, etc.), cupola size.....	17.50 to 18.00
No. 1 heavy cast, not cupola size.....	15.00 to 15.50
No. 2 cast (radiators, cast boilers, etc.).....	13.50 to 14.00

Cleveland

Ore Association Will Protest—Pig Iron Prices Show Further Declines

CLEVELAND, Oct. 31.—The Lake Superior Iron Ore Association will file exceptions to the recent report of the examiner of the Interstate Commerce Commission, who recommended that the line haul rates from the Minnesota mines to the upper lake ports be unchanged, but favored a slight reduction on rates from the old range mines to Ashland, Escanaba and Marquette. The association has until Nov. 9 to file exceptions to the report. A meeting of the rate committee of the association and attorneys for various mining interests was held here Monday to map out plans for attacking the examiner's findings. After the filing of the bill of exceptions the Interstate Commerce Commission will set a date for final argument and both the ore shippers and railroads will be heard orally.

Car Supply Improves.—The transportation situation shows further improvement. Reports from Youngstown indicate that mills there are now getting a fair car supply so that they are able to ship practically all their product. Shipments to this territory from the Pittsburgh district are better, although they have not improved to the extent that they have from Youngstown. Consumers in this territory now appear to be getting steel as fast as they need it.

Iron Ore.—The ore movement is still being delayed somewhat by the car shortage. As very little dock space is available, boats are being held at lake ports

until cars can be had. As many boats have been diverted to the grain trade wild vessel capacity for ore can probably not be secured except at an advance over the regular rates, but there is little demand for wild tonnage. Most shippers are well up on their schedules and several will be virtually through with their shipments for the season by Nov. 15.

We quote delivered lower lake ports: Old range Bessemer, 55 per cent iron, \$5.95; Old range non-Bessemer, 51½ per cent iron, \$5.20; Mesabi Bessemer, 55 per cent iron, \$5.70; Mesabi non-Bessemer, 51½ per cent iron, \$5.05.

Pig Iron.—The market is dull and weak. Foundry and malleable grades have settled down to virtually a \$30 base price in northern Ohio, this price being quoted both by Valley and Lake furnaces. Prices have offered little resistance to pressure and have declined in spite of the fact that no round lot inquiry has come out to test the market. The largest sale reported at a delivery point where competition was keen because of the geographical position, was a 500-ton lot purchased by a Mansfield implement manufacturer, and it is understood that the highest quotation on this inquiry was \$31. One Cleveland producer has reduced its price on foundry iron for Cleveland delivery \$1.50 per ton to \$32 delivered, bringing its price slightly above the price at which iron can be shipped in from outside producing points. Another Cleveland interest has not yet met the price situation and is quoting foundry iron at \$32 for outside shipment and \$33.50 for local delivery. Foundries are looking for further price reductions and as a rule are buying only for their immediate requirements. However, some additional inquiry has come out for the first quarter of next year, and a lake furnace reports a sale of 1000 tons foundry iron for that delivery. This same producer made sales aggregating several thousand tons during the week. Southern iron has settled down to a \$27 base with no demand. Ohio silvery iron has been reduced to \$39.50 for 8 per cent silicon. This is a \$2 reduction from the schedule price and \$3 lower than some of the producers have been quoting recently for early shipment.

Quotations below, except on basic and low phosphorus iron, are delivered Cleveland and for local iron includes a 50c. switching charge. Ohio silvery and Southern iron prices are based on a \$3.02 freight rate from Jackson and a \$6 rate from Birmingham:

Basic, Valley furnace.....	\$30.00
Northern No. 2 fdy., sil. 1.75 to 2.25.....	\$31.75 to 32.00
Southern fdy., sil. 1.75 to 2.25.....	31.00 to 33.00
Malleable.....	31.75 to 32.00
Ohio silvery, sil. 8 per cent.....	44.52 to 45.52
Standard low phos., Valley furnace.....	37.00 to 38.00

Semi-Finished Steel.—A local producer reports sales of several lots of sheet bars, billets and slabs aggregating about 10,000 tons at \$40. However, because of the decline in pig iron, somewhat lower prices are looked for.

Finished Material.—The market as a whole is rather dull, although there is considerable activity in steel bars and orders include some large lots. Prices are inclined to softness, but in this respect practically no change developed during the week. While sales of steel bars are reported at 1.95c. for attractive orders, the bulk of the business seems to have been taken at 2c. Plates are generally quoted at 2c. to 2.10c., with some of the smaller mills still making sales at 2.25c., which is now the maximum quotation for quick shipment. Structural material is commonly quoted at 2c. New demand for plates for oil tank work has appeared. The Mexican Petroleum Co. is inquiring for tanks that will require 7000 tons of plates. The Gulf Refining Co. has placed eight tanks, requiring 1200 tons, with the Riter-Conley Co., and Utah Mfg. Co. has placed a tank order requiring 300 tons with the Kansas City Structural Co. An automobile rim manufacturer in this territory has placed 2000 tons of rim steel for early shipment. Automobile manufacturers are buying little steel at present, this being particularly true of alloy steels. However, reports indicate that manufacturers of medium priced cars have sufficient orders to keep their plants at a maximum capacity for the next two or three months.

Jobbers quote steel bars, 2.91c.; plates and structural shapes, 3.01c.; No. 9 galvanized wire, 3.30c.; No. 9 annealed wire, 2.80c.; No. 28 black sheets, 4.40c.; No. 28 galvanized sheets, 5.40c.; No. 10 blue annealed sheets, 3.70c. to 3.76c.; hoops and bands, 3.71c.; cold-rolled rounds, 3.75c.; flats, squares and hexagons, 4.25c.

Sheets.—The softening of the sheet market noted last week has become more pronounced. Black sheets are commonly quoted by independent mills at the American Sheet & Tin Plate Co., price of 3.35c. Galvanized sheets are firmer than black, although some mills are quoting these at 4.35c. Blue annealed sheets appear firm at 2.60c. for the heavier and 2.75c. for the lighter gages.

High Speed Steel.—The market is not active. The more common quotation for small lots of 18 per cent tungsten high speed steel is 75c. per lb. and has a range from 60c. for round lots up to 90c. for certain brands.

Hot-Rolled Strip Steel.—The demand continues good with prices firm at 2.90c. for the wider sizes and 3.25c. for the narrow sizes.

Reinforcing Bars.—Attractive business has brought out a concession of \$1 a ton on reinforcing bars to 1.95c., but the general quotation for car lot orders is still 2c. The demand continues fairly active.

Bolts, Nuts and Rivets.—Bolt and nut manufacturers are getting a heavy volume of specifications on contracts at the September prices and are booking some small lots of miscellaneous business at the new price. They report an improvement in steel shipments, but are complaining of the scarcity of some lines of labor. Little new business in rivets is coming out, but orders on old contracts are heavy. Prices are firm at the recent advance.

Coke.—Prices on foundry coke have further declined to from \$10 to \$11 for standard Connellsville makes and consumers are buying only in car lots for immediate requirements. Foundry coke is still high as compared to furnace coke which seems plentiful at \$8.

Old Material.—The market is dull and the price situation is uncertain. Although there is no particular sign of weakness, dealers seem to be unable to form an opinion as to whether the prices will remain at present levels or decline. There is virtually no buying by consumers and little trading among dealers as these are fairly well covered on outstanding contracts. Sales are reported in small lots of choice heavy melting steel at \$22 to dealers for Warren and Youngstown deliveries, but this price appears higher than the current market. Specialties such as couplers, knuckles, etc., are firm, sales for these being reported at prices equivalent to \$24, Youngstown. The Big Four Railroad received quotations Tuesday on a blank scrap list. There is virtually no change in prices with the exception of a decline of 75c. per ton on flashings.

We quote per gross ton, f.o.b. Cleveland, as follows:

Heavy melting steel.....	\$18.75 to \$19.00
Steel rails under 3 ft.....	21.00 to 21.25
Steel rails for rolling.....	21.00 to 21.50
Iron rails.....	18.00 to 18.50
Iron car axles.....	26.00 to 27.00
Low phosphorus melting.....	20.00 to 20.50
Cast borings.....	15.00 to 15.25
Machine shop turnings.....	14.50 to 14.75
Mixed borings and short turnings	14.75 to 15.00
Compressed steel.....	17.00 to 17.25
Railroad wrought.....	18.00 to 18.50
Railroad malleable.....	20.00 to 21.00
Light bundled sheet stampings..	13.75 to 14.00
Steel axle turnings.....	16.00 to 16.50
No. 1 cast.....	21.00 to 21.50
No. 1 busheling.....	12.50 to 13.50
Drop forge flashings over 10 in.	12.75 to 13.25
Drop forge flashings under 10 in.	12.50 to 13.50
Railroad grate bars.....	17.00 to 18.00
Stove plate.....	17.00 to 18.00
Pipes and flues.....	13.75 to 14.00

Buffalo

Sales and Inquiry for Pig Iron Light, with Lower Prices Expected

BUFFALO, Oct. 30.—Though there is no further manifestation of price softening, there is a feeling in this market that there will be a further decline in the month of November. Sales and inquiries are extremely light and while \$29.50 is the usual quotation on No. 2 plain, the general impression is that a livelier demand would bring price concessions from those interests having iron available. On several sales of off grade iron, a price of \$28 has been made. The 50c. differential is in effect, but one furnace is trying to get a dollar

differential without success. There is very little commitment for first quarter, and the general run of inquiry is for small tonnages. A 5000-ton inquiry previously referred to in THE IRON AGE has not been placed with a Buffalo seller. None of the local sellers sees a brisker movement in the near future, notwithstanding their surveys of consumers show that practically all are working with as small stocks of iron on hand as is absolutely essential to continued operation. Shipping difficulties are worse, if such a situation is possible, but a prospective improvement is seen in the fact that water transportation will soon be concluded in this section, and cars now used in connection with water traffic will be available.

We quote f.o.b. per gross ton Buffalo as follows the higher prices being for early shipment:

No. 1 foundry, 2.75 to 3.25 sil.....	\$30.50
No. 2X foundry, 2.25 to 2.75 sil.....	30.00
No. 2 plain, 1.75 to 2.25 sil.....	29.50
Basic.....	30.00
Malleable.....	31.00
Lake Superior charcoal.....	36.25

Finished Iron and Steel.—Demand for bars, shapes and plates is not as strong as it was some time ago. Inquiry is steady, however, and is mostly concerned with carload lots. There is a livelier call for wire products and tin plate; on the latter, new prices are expected this week and all the regular buyers are interested and awaiting this schedule. Bar prices have not dropped below 2 cents, and this has been done by a few of the sellers only where delivery concessions were taken into consideration. Shapes range from 2c. to 2.10c., and plates at 2.15c., while 2.15c. on bars could be obtained for quick delivery. Two of the leading Buffalo factors on plates are virtually in a situation where they will no longer be able to consider plate business. One is a local maker and the other a branch of an independent. In the case of the local interest their plate mill has been down for some months, and there is no likelihood of it being put into operation very soon; the other is finding it more profitable to roll sheet bars. Sheets are in good demand and prices are firm at 3.50c. for black and 4.50c. for galvanized. The car situation is discouraging; relief noted a few days ago has disappeared, and the situation is generally on the same level as has existed right along. Structural work on jobs involving less than 100 tons are brisk, but nothing greater than 100 tons has appeared or is immediately in prospect.

We quote warehouse prices, Buffalo, as follows:

Structural shapes, 3.20c.; plates, 3.20c.; soft steel bars, 3.10c.; hoops, 4.10c.; bands, 3.90c.; blue annealed sheets, No. 10 gage, 4.05c.; galvanized steel sheets, No. 28 gage, 5.85c.; black sheets, No. 28, 4.85c.; cold rolled round shafting, 3.95c.

Warehouse Business.—Structural shapes are more in demand than any other warehouse product, and while the general volume on all lines is good, there is a noticeable decrease in the size of tonnages buyers ask for. Prices are firm and an expected softening of prices is now regarded as improbable, because of the several wage increases by mills. Bars and bands are in fair demand, but sheets are slow.

Coke.—The range of coke prices, f.o.b. Connellsville, is \$9.50 to \$11 for best foundry grades. Demand has diminished within a few days.

Old Material.—Mills will not pay in excess of \$19.50 for heavy melting steel, and dealers have declined to meet this situation. Some of the buyers who paid \$20 a few weeks ago have taken a stand at \$19, and in consequence of the difference, there is a decided lull in transactions. The demand for turnings and borings has fallen off and most of the consumers are well supplied for the present. Demand for low phosphorus and railroad malleable is good, but the supply is scarce. Other lines of old material are quiet.

We quote dealers' asking prices per gross ton f.o.b. Buffalo as follows:

Heavy melting steel.....	\$20.00 to \$21.00
Low phos., 0.04 and under.....	21.00 to 22.00
No. 1 railroad wrought.....	19.00 to 20.00
Car wheels.....	21.00 to 22.00
Machine-shop turnings.....	14.50 to 15.50
Cast iron borings.....	17.50 to 18.00
Heavy axle turnings.....	17.50 to 18.50
Grate bars.....	16.00 to 17.00
No. 1 busheling.....	17.00 to 18.00
Stove plate.....	17.00 to 18.00
Bundled sheet stampings.....	14.00 to 15.00
No. 1 machinery cast.....	21.00 to 22.00
Hydraulic compressed.....	18.00 to 19.00
Railroad malleable.....	20.50 to 21.50

Boston

Competition Between Domestic and Foreign Iron Is Growing Keener

BOSTON, Oct. 31.—More pig iron business passed through local firms the past week, but buying is far from active. Aggregate October sales in this territory are large, however, mostly foreign iron. Some heretofore active foreign iron interests are practically cleaned up on offerings and plan to withdraw from the market. Selling interest at the moment centers largely in a Massachusetts textile machinery maker's inquiry for 500 to 1000 tons each of silicon 1.75 to 2.25 and silicon 5.00 to 6.00, domestic or foreign iron, late 1922 or early 1923 delivery. Lower offerings on foreign iron have been made on this business. Continental iron, silicon 2.50 plus, is offered at \$27 to \$28 duty paid on dock, and English on the same basis, while similar Scotch, heretofore held at \$31 to \$33, is now available at \$30 and less, plus duty. The softness of foreign iron prices is due to concessions made by domestic furnaces. An inquiry the past week for 500 tons No. 1X, 1922 delivery, by a local textile machinery maker for a Maine subsidiary, brought out offers of less than \$35 delivered from two Northern furnaces, which figures under \$30, furnace, based on regular differentials. All Alabama furnaces operating in New England are now on a \$27.50 furnace base. Virginia furnaces so far have maintained prices. It is evident, however, that competition between domestic and foreign irons is growing keener.

Receipts of foreign iron for the week ending Oct. 28 amounted to 3500 tons of Scotch, part of which is consigned to Philadelphia and will be unloaded at that port. During the previous week 4734 tons arrived at Boston, and in the week before that 14,750 tons.

We quote delivered prices, on the basis of the latest reported sales, now infrequent, and as follows, having added to furnace prices \$3.65 freight from eastern Pennsylvania, \$4.91 from Buffalo, \$5.92 from Virginia and \$9.60 from Alabama:

East. Penn., sil. 2.25 to 2.75....	\$34.15 to \$36.15
East. Penn., sil. 1.75 to 2.25....	33.65 to 35.65
Buffalo, sil. 2.25 to 2.75.....	34.91 to 36.41
Buffalo, sil. 1.75 to 2.25.....	34.91 to 35.91
Alabama, sil. 2.25 to 2.75.....	37.60
Alabama, sil. 1.75 to 2.25.....	37.10
Virginia, sil. 2.25 to 2.75.....	38.92
Virginia, sil. 1.75 to 2.25.....	37.92

Warehouse Business.—Soft steel and refined iron bars have been reduced 18½¢. per 100 lb., and structural shapes as much, but iron and steel warehouse prices otherwise remain unchanged. Lower prices are based on increased stocks and the elimination of mill extras. Warehouse extras are generally charged. The movement of iron and steel out of stock is slightly larger. Bolts and nuts are in normal demand. Three local concerns are carrying large stocks, but others have comparatively little material on hand. Rumors of an impending advance in warehouse prices are freely circulated. Jobbers have announced new season prices on wire goods. Black and galvanized wire cloths are slightly lower than last season, bronze a little higher, and pearl unchanged, while netting values show little variation.

Jobbers quote: Soft steel bars, \$3.065 per 100 lb. base; flats, \$3.85; concrete bars, 3.16½¢.; structural steel, \$3.065 to \$3.50; tire steel, \$4.50 to \$4.85; open-hearth spring steel, \$5 to \$6.50; crucible spring steel, \$12; steel bands, \$4.25; hoop steel, \$4.75; cold rolled steel, \$4 to \$4.50; refined iron, \$3.065; best refined iron, \$4.50; Wayne iron, \$5.50; Norway iron, \$6.60 to \$7.10; plates, 3.16½¢. to \$3.35; No. 10 blue annealed sheets, \$4.15 per 100 lb. base; No. 28 black sheets, \$5.40; No. 28 galvanized sheets, \$6.40.

Finished Material.—Local mill representatives continue to report a fair business in bars, plates, sheets and miscellaneous small products. Individual orders, however, call for small tonnages, but the number of orders booked is increasing. Bids are asked on 700 tons of structural steel for a local police station, bringing the total amount under negotiation in this territory up to approximately 10,000 tons. The Boston Bridge Works, Inc., is awarded 150 tons for a Cambridge, Mass., bakery. The Boston Elevated Co. has awarded a contract for 30 new type one-man cars to the Laconia Car Co., Boston. The city of Pittsfield has purchased three

10-ton tractors, two of the Best and the third of the Holt type.

Coke.—The flurry of first-half 1923 by-product coke buying has subsided, most of the foundry trade having contracted. Both the New England Coal & Coke Co. and the Providence Gas Co. are maintaining operating schedules and are up to date on 1922 contract shipments. The demand for spot foundry coke therefore is limited to a stray car now and then. Both companies continue to quote by-product fuel at \$16.50 delivered within the \$3.10 freight zone. The undertone of the market, nevertheless, is unsettled due to the fact that Connellsville by-product coke is now down to a basis where it can compete with New England product. The uncertainty of the car situation is the one disturbing factor in the Connellsville coke market.

Old Material.—A further shrinkage in demand for old material has made for uncertainty as to values. The market, however, is not as soft as it appears on the surface. For instance, dealers who paid \$14 and \$14.50 on cars shipping point for heavy melting steel a fortnight or so ago, have dropped their price to \$13, but admit they can buy little material. The lack of actual transactions at \$13 would make reports of actual weakness appear unfounded. Purchase of No. 1 yard wrought the past week for eastern Pennsylvania mills at \$18.50 delivered, brings the f.o.b. Boston price down to around \$14, which indicates no weakness in this material. Inquiries for several hundred tons of cast iron chemical borings remain in the market with bids ranging from \$19 on cars shipping point up, unchanged from last week. A central Massachusetts textile machinery maker is offering 200 tons of these borings and has turned down \$19. Other borings and turnings prices remain as heretofore where actual transactions take place. Dealers have paid 90¢. a 100 lb. for machinery cast on cars shipping point the past two or three days, which certainly indicates no weakening in such material. The most important old material interests in this territory look upon the present quietness as temporary and due to the transportation situation. Confidence is expressed that buying will shortly resume with prices as high or higher than heretofore.

The following prices are for gross ton lots delivered consuming points:

No. 1 machinery cast.....	\$22.00 to \$23.00
No. 2 machinery cast.....	20.00 to 21.00
Stove plate.....	17.50 to 18.00
Railroad malleable.....	19.00 to 19.50

The following prices are offered per gross ton lots f.o.b. Boston rate shipping points:

No. 1 heavy melting steel.....	\$13.50 to \$15.50
No. 1 railroad wrought.....	16.00 to 16.50
No. 1 yard wrought.....	14.00 to 14.50
Wrought pipe (1 in. diam., over 2 ft. long).....	11.00 to 11.50
Machine shop turnings.....	12.00 to 12.50
Cast iron borings, rolling mill.....	14.00 to 14.50
Cast iron borings, chemical.....	18.00 to 19.00
Blast furnace borings and turnings.....	12.00 to 12.50
Forged scrap and bundled skeleton.....	11.00 to 11.50
Shafting.....	19.00 to 19.50
Street car axles.....	23.00 to 24.00
Street car wheels.....	18.00 to 19.50
Rails for rolling.....	16.50 to 17.00

Cincinnati

Southern Iron Declines \$2—Silveries Reduced by Jackson County Makers

CINCINNATI, Oct. 31.—There is little activity in the Cincinnati iron market, buyers apparently keeping out of the market until long delayed shipments start to roll in, and in the meantime helping one another out by borrowing and buying small lots. As a result, the market is showing a softer tone, and Southern iron is off \$2 from the previous low, it being available at \$25, base Birmingham, to-day. Silveries, with little activity, have been reduced voluntarily by Jackson County makers \$2 a ton, the new schedule calling for \$39.50 for 8 per cent. On foundry grades, there is little appreciable change in the southern Ohio district as regards prices, though plans are under way to blow in a number of furnaces on foundry iron, of which there is practically none on furnace yards. Reports are heard of further

recessions on iron by lake front furnaces, it being reported that a northern Ohio melter had closed for 500 tons at \$29.50, furnace. A Detroit melter bought 700 tons of Chicago iron at \$29.50, furnace. Another Detroit melter bought 700 tons of Chicago iron at \$30, furnace, and a Michigan automobile manufacturer closed on 1500 tons of electrolytic ferrosilicon, 14 to 16 per cent, at a reported price of \$45, delivered, the order going to a Canadian producer. The Louisville & Nashville Railroad bought 775 tons of Southern, of which 700 was reported to have been placed at less than \$26.50, base, and 75 tons of special iron at \$28, base. The only inquiry of consequence comes from an Indiana stove manufacturer, who asks for 500 tons of Southern. A Chicago district melter is in the market for 500 to 1000 tons of foundry. Two of the smaller furnaces in the Ironton district have bought coke, and will likely blow in about Nov. 15. This will make 10 of 17 furnaces in southern Ohio active.

Based on freight rates of \$4.05 from Birmingham and \$2.27 from Ironton, we quote f.o.b. Cincinnati:

Southern coke, sil. 1.75 to 2.25 (base)	\$29.05 to \$31.05
Southern coke, sil. 2.25 to 2.75 (No. 2 soft)	29.55 to 31.55
Ohio silvery (nominal), 8 per cent	41.77
Southern Ohio coke, sil. 1.75 to 2.25 (No. 2)	33.27
Basic Northern	32.27
Malleable	33.27

Tool Steel.—While the demand for tool steel has fallen off somewhat during the past two weeks, sales are still considered fair. Indications are that increasing manufacturing operations, particularly in machinery building plants, will show a big improvement, and as stocks of tool steel are not being carried, this will mean better business for mills. Prices are strong, at from 75c. per lb. for 18 per cent tungsten high speed steel, to 95c. for special brands of some companies.

Finished Material.—The demand for finished materials showed improvement during the past week, though orders are still being placed in small lots. Shipments from mills are showing a slight improvement, and deliveries on last quarter contracts are taking care of the major portion of the needs of consumers. A better demand for sheets is reported, and plates are still fairly active. On bars and shapes, however, the demand has slowed up, and 2c. is now the common quotation, the outside price of 2.25c. having entirely disappeared. The going price on plates, for the small orders being booked, is 2.15c., though on anything like an attractive order 2c. to 2.10c. can be easily done. There is a brisk demand for wire nails, but on other wire products little interest is being shown. Tin plate orders have been fairly numerous for this season of the year, and some inquiries have been received for first half of next year, on which it is reported that a price of \$5 per base box has been quoted by a manufacturer. Fair activity in the structural field is reported, the largest letting reported being a railroad bridge by the Lake Erie & Western Railroad at Lima, Ohio, 600 tons. The Chevrolet Motor Co. is taking bids on a new plant in Norwood, for which approximately 1200 tons of steel will be required. The Third National Bank, Dayton, Ohio, is having plans prepared for an office building involving an expenditure of approximately \$1,500,000.

Reinforcing Bars.—There is a fair demand for reinforcing bars, and a number of awards involving a fair tonnage have been reported. Recent lettings include:

Tri-State Hotel, Memphis, Tenn., 700 tons, general contract to James Alexander Co. Sisters of Mercy Academy, Cincinnati, 150 tons, to Bourne-Fuller Co. Newton Tea & Spice Co.'s plant, Cincinnati, 100 tons, to Bourne-Fuller Co.

Pending business includes:

High School for Girls, Louisville, Ky., 150 tons, bids in. Elks' temple, Louisville, Ky., 150 tons, bids closed Nov. 1. Brotherhood of Railway Clerks' office building, Cincinnati, 500 tons, bids closed Oct. 28.

Coke.—There is a fair demand for foundry coke, and several furnaces bought a supply for a two to three month operation last week. Included in these were Marting and Kelly furnaces at Ironton. The Ironton by-product ovens will be in operation this week. Prices are easier, in some districts, Pocahontas foundry now being quoted at \$11, and the Ashland producer having reduced foundry prices to \$11 for November contracts. In other districts, prices are the same as last week.

Warehouse Business.—Local jobbers report a brisk demand for reinforcing bars, structural shapes, small angles, and sheets. Wire nails are also in good demand, and stocks are running low. Prices show no change.

Cincinnati jobbers quote: Iron and steel bars, 2.95c. base; reinforcing bars, 3.05c. base; hoops, 4.05c. base; bands, 3.85c. base; shapes and plates, 3.05c. base; cold-rolled rounds, 3.75c. base; cold-rolled flats, squares and hexagons, 4.25c. base; No. 10 blue annealed sheets, 4c.; No. 28 black sheets, 4.70c.; No. 28 galvanized sheets, 5.75c.; No. 9 annealed wire, \$3.10 per 100 lb.; common wire nails, \$3.20 per keg, base.

Old Material.—Several important sales of steel grades are reported for shipments to other districts, the delivered prices ranging from \$21.50 to \$22.50 on heavy melting steel. As a general thing, however, the market is rather quiet, dealers not being desirous of pushing sales in this market, as they have a feeling that higher prices will be seen shortly. Only fair buying of foundry grades is reported, with prices showing little change from last week.

We quote dealers' buying prices, f.o.b. cars Cincinnati:

Per Gross Ton	
Bundled sheets	\$13.00 to \$14.50
Iron rails	17.00 to 18.00
Relaying rails, 50 lb. and up.	26.50 to 27.00
Rolls for rolling	18.50 to 19.00
Heavy melting steel	17.50 to 18.50
Steel rails for melting	16.00 to 17.00
Car wheels	20.00 to 21.00
Per Net Ton	
No. 1 railroad wrought	14.50 to 15.00
Cast borings	11.50 to 12.00
Steel turnings	10.50 to 11.00
Railroad cast	18.00 to 19.00
No. 1 machinery	21.00 to 21.50
Burnt scrap	12.00 to 12.50
Iron axles	20.50 to 21.00
Locomotive tires (smooth inside) ..	14.50 to 15.50
Pipes and flues	9.00 to 9.50

St. Louis

Pig Iron Prices Lower, One Seller Going as Low as \$25, Birmingham

ST. LOUIS, Oct. 31.—The pig iron market is easier. The St. Louis Coke & Chemical Co. is now quoting \$31.50 to \$32 at the Granite City furnace, to meet which price Chicago district makers are quoting on the basis of \$30, Chicago, although they are quoting \$31, Chicago, for that territory. The prevailing quotation on Southern iron is at \$27.50, Birmingham, the price being maintained by all of the makers in that district, with the exception of one, which has quoted \$25, Birmingham. The latter, a furnace of small capacity, has just resumed operations after having been out of blast for months and, unlike other makers, has no order file. The low price has had no effect yet on the price of other makers in that field. Melters in this district are playing a waiting game. Very little business was placed for fourth quarter delivery and virtually none for first quarter. The melt is on the increase, especially among the stove furnaces, and it is only a question of time when they must get into the market again. No inquiries are before the market. So long as melters are showing no disposition to buy, there can be no real test of the market. Such orders as are being placed are mostly for carloads for quick shipment, and there is not so much of this kind of business. The Granite City maker sold 1500 tons of foundry iron to a Western melter, and 1000 tons to an East Side melter.

We quote delivered consumers' yards, St. Louis, as follows, having added to furnace prices \$2.16 freight from Chicago, \$3.28 from Birmingham (rail and water), \$5.17 from Birmingham, all rail, and 81 cents average switching charge from Granite City:

Northern foundry, sil. 1.75 to 2.25	\$32.16
Northern malleable, sil. 1.75 to 2.25	32.16
Basic	32.16
Southern foundry, sil. 1.75 to 2.25	\$30.17 to 32.17

Finished Iron and Steel.—Fabricators report that there is a slight increase in small jobs, but there still is a dearth of inquiries requiring any considerable tonnage. Fabricators in the district are well booked up with orders for the remainder of the year, but they are looking for business for beyond that period. They placed a few small orders with steel mills during the week. Jobbers are not buying very much, although one jobber is said to have placed shipping instructions covering a large tonnage of merchantable bars ordered some time ago. Railroad inquiries from railroads centering

in St. Louis are very light. The Louisville & Nashville Railroad is in the market for tanks involving about 2000 tons of tank plates, and the Texas Electric Railway at Dallas wants 55 axles. There also is an inquiry for 100 tons of galvanized wire.

For stock out of warehouse we quote: Soft steel bars, 2.90c. per lb.; iron bars, 2.90c.; structural shapes, 3c.; tank plates, 3c.; No. 10 blue annealed sheets, 4.10c.; No. 28 black sheets, cold rolled, one pass, 4.85c.; cold drawn rounds, shafting and screw stock, 3.90c.; structural rivets, 3.60c. per 100 lb.; boiler rivets, 3.70c.; tank rivets, $\frac{7}{8}$ in. and smaller, 55 per cent off list; machine bolts, large, 50 per cent; smaller, 50 per cent; carriage bolts, large, 55-5 per cent; small, 60 and 10 per cent; lag screws, 55 per cent; hot pressed nuts, square or hexagon blank, \$2.75; and tapped, \$2.75 off list.

Coke.—The coke market may be easier in the East, but producers in this district are holding firm. The Granite City by-product producer reports an improved coal supply and oven operations are at 100 per cent capacity, but it has so many orders that they are not influenced by the easy situation elsewhere. The Terre Haute ovens are also holding firm at \$16 ovens for foundry coke and \$11 to \$12 for domestic coke. Connellsville brands are lower.

Old Material.—The market for old material is easier. As is usual following a decline in the market, country dealers are offering their supplies. The railroads are not moving much old material and but one list is before the market, the Southwestern region of the Pennsylvania, their list being 3700 tons. Users of old material are very busy and dealers feel that they shortly will be in the market again for supplies. While inquiries for relaying rails are not so numerous as they have been, still there is a good business in this item from industrial interests.

We quote dealers' prices f.o.b. consumers' works, St. Louis industrial district and dealers' yards, as follows:

Per Gross Ton	
Iron rails	\$21.00 to \$21.50
Rails for rolling	20.00 to 20.50
Steel rails, less than 3 ft.	21.50 to 22.00
Relaying rails, standard section..	26.00 to 29.00
Cast iron car wheels	23.00 to 23.50
Heavy melting steel	17.00 to 17.50
Heavy shoveling steel	16.00 to 16.50
Frogs, switches and guards cut apart	17.00 to 17.50

Per Net Ton	
Heavy axles and tire turnings...	11.50 to 12.00
Steel angle bars	17.00 to 17.50
Iron car axles	27.50 to 28.00
Steel car axles	20.50 to 21.00
Wrought iron bars and transoms	23.00 to 23.50
No. 1 railroad wrought	16.00 to 16.50
No. 2 railroad wrought	15.00 to 15.50
Railroad springs	20.00 to 20.50
Steel couplers and knuckles	21.00 to 21.50
Cast iron borings	11.00 to 11.50
No. 1 busheling	14.25 to 14.75
No. 1 railroad cast	19.00 to 19.50
No. 1 machinery cast	20.00 to 20.50
Railroad malleable	20.25 to 20.75
Machine shop turnings	9.50 to 10.00

Birmingham

Pig Iron Shows Declining Prices in an Extremely Dull Market

BIRMINGHAM, ALA., Oct. 31.—One of the dullest weeks on record in the Birmingham iron market was that ending last Saturday. Not a single order involving real tonnage was booked so far as came to the surface. The largest deal heard of is reported from Detroit, where a stove maker is understood to have booked 500 tons at \$27, Birmingham base. One company is openly offering pig iron at \$25, and it became generally known to-day that one other maker is reported as having already marked down to that base. Other makers have the matter in hand to-day. The company which first named \$25 operates one stack at Holt, Ala. All indications point to its lead being generally followed. Sales at higher base have been neglected for two weeks, with soil and pressure pipe makers protesting against high prices. The latest sale at \$28.50 involved 500 tons for this year and was made the Saturday before last. Anything like that has not been repeated. The deadlock between pipe makers and iron makers was pronounced and open at close of the week. Soil pipe is dull, some

plants slowing down and makers will not buy at present levels if they have to go to the new year, they openly declare. Large pressure pipe makers have good business on books, but they are afraid of higher priced iron and say they will not think of buying at the present base. If this state exists until inventory season, there seems small prospect of much iron buying before the end of the year. Southern melt of all kinds continues large.

We quote per gross ton f.o.b. Birmingham district furnaces as follows:

Foundry, silicon 1.75 to 2.25	\$25.00 to \$27.00
Basic	27.50
Charcoal, warm blast	33.00

Finishing Mills.—Southern wire drawing mills report fully as good business as during the past two months with warehouse stocks moving out fairly well and a good run of new business all around. Much business for Southern delivery was diverted to Southern mills from Northern on account of car shortage. The Tennessee company continues double turn at all finishing mills. The week's exports included 3351 tons of rails for Yokohama and 400 tons of rails, 437 tons of sulphate of ammonia and 300 tons of angle bars for Kobe. Gadsden and Birmingham wire drawing mills moved 900 tons of nails and wire to Pacific Coast points.

Sanitary Pipe.—Soil pipe is very dull and some plants are slowing down. The base remains at \$50 and \$55 with few offers at that. Jobbers are out of the market. Pressure pipe is going better, Southern municipalities continuing improvement work during the winter. Memphis has taken 500 tons from the United States Cast Iron Pipe & Foundry Co. The base is \$43.

Old Material.—The scrap market holds its own at present prices, the tonnage going at the high figures being about the same as that going at the lower owing to activity in small plants. Steel scrap has not been so active following recent good buying.

We quote per gross ton f.o.b. Birmingham district yards as follows:

Steel rails	\$16.00 to \$17.00
No. 1 steel	14.00 to 16.00
No. 1 cast	18.00 to 20.00
Car wheels	18.00 to 20.00
Tramcar wheels	17.00 to 19.00
Stove plate	16.00 to 17.00
Cast-iron borings	9.00 to 10.00
Machine shop turnings	9.00 to 10.00

Philadelphia

Falling Off of Demand Now More Apparent—All Prices Easier

PHILADELPHIA, Oct. 31.—A more marked falling off in the demand for pig iron, steel and old material, together with further weakening of prices, leaves both buyers and sellers in a quandary as to what the nearby future has in store. Buyers are exercising great caution and, as is usual in a market situation like the present, are unwilling to commit themselves for more than urgent requirements when each week brings slightly lower quotations. In steel the position of the mills is fairly satisfactory for the remainder of the year, excepting plates, which are not in demand, and plate orders on the books do not represent, as a rule, more than two or three weeks' rollings. In pig iron the situation is decidedly unsatisfactory from the standpoint of the operators, as there is very little business and prices show no stability. One effect of the weak pig iron market may be to defer the blowing in of some furnaces which were to start operations as soon as coke prices got down to a moderate basis.

There has been very little business of an important character during the week, except in basic pig iron, one Eastern steel company taking 12,000 tons for November shipment at prices \$1 a ton lower than its last large purchase about a month or so ago. Some old material prices are lower and there is very little buying.

Complaints are heard of delays in getting cars and shipments once started take longer than they should, due to congestion at various junction points. Railroad embargoes add to the transportation confusion. However, there is little or no distress among consumers in

the East, who appear to be keeping abreast of their normal requirements.

Pig Iron.—The only important pig iron transaction of the week was the purchase to-day of 12,000 tons of basic by an Eastern steel company at prices ranging from \$28.50 to \$29, delivered, this being \$1 a ton lower than was paid by this company on its last large purchase about a month ago. The business was divided among at least three furnaces. In foundry iron also, there is pronounced weakness, and domestic grades are quoted \$1 a ton below last week's published prices. No. 2 plain in large lots is to be had at \$29, furnace, and No. 2X at \$30, while for smaller lots \$30 and \$31, furnaces, for these two grades are asked. Foreign iron keeps pace with domestic iron in the decline of prices. English iron equivalent to No. 2 plain and No. 2X is to be had at \$27.75 and \$28.75, Philadelphia, duty paid, and some No. 3 Scotch iron, which local importers are anxious to move promptly from docks, is to be had at \$29.50 to \$30, Philadelphia, duty paid. Two eastern Pennsylvania and one Virginia furnace are now definitely scheduled to go into blast in November. The Alan Wood Iron & Steel Co. will probably put its No. 3 stack in blast Nov. 15. The Robeson furnace will go in about the same time and will make both foundry and low phosphorus iron. The Pulaski Iron Co. has decided to put its furnace in operation on Nov. 10. Low Moor will probably go in as soon as a coke supply can be assured. No definite plans have been made yet for blowing in a Warwick furnace. Imports of foreign iron at Philadelphia in the past two weeks total more than 21,000 tons. In the week ended Oct. 21, the total was 9044 tons, all from England, while in the week ended Oct. 28 the total was 12,020 tons divided as follows: Scotland, 2750 tons; France, 5036 tons; England, 2250 tons; Belgium, 1984 tons.

The following quotations are, with the exception of those on low phosphorus iron, for delivery at Philadelphia and include freight rates varying from 76 cents to \$1.64 per gross ton:

East. Pa. No. 2 plain, 1.75 to 2.25 sil.	\$30.14 to \$31.14
East. Pa. No. 2X, 2.25 to 2.75 sil.	31.14 to 32.14
East. Pa. No. 1X, 2.25 to 2.75 sil.	32.14 to 33.14
Virginia No. 2 plain, 1.75 to 2.25 sil.	37.17
Virginia No. 2X, 2.25 to 2.75 sil.	38.17
Basic delivered eastern Pa.	28.50 to 29.00
Gray forge	31.00 to 32.00
Malleable	32.00 to 33.00
Standard low phos. (f.o.b. furnace)	38.00 to 40.00
Copper bearing low phos. (f.o.b. furnace)	37.00 to 38.00

Ore.—Receipts of iron ore from Sweden at Philadelphia during the two weeks ended Oct. 28 were 13,145 tons. In addition 500 tons of iron ore was received from Germany and 3083 tons of manganese ore from various sources. From British South Africa, 4500 tons of chrome ore was received.

Ferroc alloys.—A few small sales of domestic ferromanganese at \$100, furnace, have established that price. British ferromanganese continues unchanged at \$67.50, seaboard, duty for account of buyer. Spiegeleisen, either imported or domestic, is to be had at \$38, docks or furnace, as the case may be.

Semi-Finished Steel.—The American Locomotive Co. has ordered 1100 tons of special quality forging billets from an Eastern mill. Prices remain unchanged, \$40 for re-rolling quality and \$45 for forging quality, Pittsburgh base.

Plates.—Some Eastern plate mills have not more than two or three weeks' rollings ahead and are pressing the market for business without any marked results. Except for a few specific jobs, as, for example, two gas holders involving a total of about 5000 tons, for which steel was recently bought, there has been very little business of an important character in this market in the past two weeks. One mill which had been holding for 2.25c., Pittsburgh, is now quoting 2c., Pittsburgh, on desirable lots. It remains, however, that on small lots some mills are still getting above 2c., but on the other hand quotations of 1.95c., Pittsburgh, have appeared on desirable tonnages of tank steel. We now quote the plate market at 1.95c. to 2c., Pittsburgh, for large lots and at 2.10c. for small lots.

Structural Steel.—There has been a gradual falling

off in demand for structural shapes during recent weeks, due to the let-up in building work, but some of the mills have a fair quantity of business ahead. A viaduct over Olney Avenue, in Trenton, N. J., will require a few thousand tons of shapes and reinforcing bars. Plain material is quoted at 2c., Pittsburgh.

Bars.—One important producer of steel bars has 60 days' work ahead, but is not booking much new business. Merchant steel bars are firm at 2c., Pittsburgh, but it is intimated that large lots of concrete reinforcing bars are to be had at 1.95c., Pittsburgh. Bar iron is quoted at 2c., Pittsburgh, with demand almost nil.

Sheets.—The premium prices recently obtainable on sheets have almost disappeared and quotations now range from 2.60c. to 2.75c. on blue annealed; 3.35c. to 3.50c. on black and 4.35c. to 4.50c. on galvanized, all base Pittsburgh. Some mills are offering November shipments at these prices.

Rivets.—An Eastern maker of rivets has put in effect an advance in prices on small lots, its present quotations being 3c. for structural rivets in large lots and 3.15c. in small lots and 3.10c. for boiler rivets in large lots and 3.25c. in small lots, f.o.b. Pittsburgh. There has also been an advance on small rivets in small lots, the discount now being 65 per cent off list, while on large lots 65 and 5 per cent off is granted.

Warehouse Business.—The following prices are effective for steel products out of stock for delivery within the limits of Philadelphia.

Soft steel bars and small shapes, 3.025c.; iron bars (except bands), 3.025c.; round edge iron, 3.20c.; round edge steel, iron finish, 1½ x ½ in., 3.20c.; round edge steel planished, 4c.; tank steel plates, ¼-in. and heavier, 3.125c.; tank steel plates, 3/16-in., 3.33c.; blue annealed steel sheets, No. 10 gage, 3.85c.; black sheets, No. 28 gage, 4.60c.; galvanized sheets, No. 28 gage, 5.75c.; square twisted and deformed steel bars, 3.15c.; structural shapes, 3.125c.; diamond pattern plates, ¼-in., 4.80c.; 3/16-in., 5c.; spring No. 13 gage and lighter, 4.25c.; steel bands, No. 12 and hexagons, cold-rolled steel, 4.35c.; steel hoops, gage to 3/16-in., inclusive, 3.825c.; rails, 3.025c.; tool steel, 4.25c.; round cold-rolled steel, 3.85c.; squares steel, 8.50c.; Norway iron, 6.50c.

Coke.—A further easing in coke prices is noted. On furnace coke \$7.50 has been quoted on best grades from Connellsville and \$6.50, Connellsville, has been quoted on an inferior grade of furnace coke from another district. Foundry coke is about \$1 a ton higher.

Old Material.—Purchase of 50,000 tons of heavy melting steel by a Pittsburgh steel company at \$21, Pittsburgh, has had no appreciable effect on the Eastern situation, though most of this steel will be shipped from the East. An Eastern mill has bought 300 tons of scrap rail at \$17, delivered, which is a decline of 50c. a ton within a week. The highest being paid is \$17.50, which dealers are offering on contracts made a few weeks ago at \$18. Several grades of scrap are lower in price, notably low phosphorus melting steel, car wheels, No. 1 railroad wrought, bundled sheets for steel works, blast furnace turnings, cast borings and pipe.

We quote for delivery at consuming points in this district as follows:

No. 1 heavy melting steel	\$17.00 to \$17.50
Scrap rails	17.00 to 17.50
Steel rails for rolling	21.00 to 22.00
No. 1 low phos., heavy 0.04 and under	24.00 to 25.00
Cast iron car wheels	21.00 to 22.00
No. 1 railroad wrought	21.00 to 22.00
No. 1 yard wrought	19.00 to 20.00
No. 1 forge fire	16.00 to 16.50
Bundled sheets (for steel works)	15.50 to 16.00
No. 1 busheling	15.50 to 16.00
Turnings (short shoveling grade for blast furnace use)	15.50 to 16.00
Mixed borings and turnings (for blast furnace use)	15.50 to 16.00
Machine shop turnings (for steel works use)	15.50 to 16.00
Machine shop turnings (for rolling mill use)	15.50 to 16.00
Heavy axle turnings (or equivalent)	16.00 to 17.00
Cast borings (for steel works and rolling mills)	16.00 to 16.50
Cast borings (for chemical plants)	21.00 to 23.00
No. 1 cast	22.00 to 23.00
Heavy breakable cast (for steel plants)	21.00 to 22.00
Railroad grate bars	17.50 to 18.00
Stove plate (for steel plant use)	17.50 to 18.00
Railroad malleable	15.50 to 16.50
Wrought iron and soft steel pipes and tubes (new specifications)	15.00 to 16.00
Shafting	22.00 to 23.00
Steel axles	27.50 to 28.00

Prices Finished Iron and Steel, f.o.b. Pittsburgh

Plates	
Sheeted, tank quality, base, per lb.	2.00c. to 2.25c.
Structural Material	
Beams, channels, etc.	2.00c. to 2.10c.

Iron and Steel Bars	
Soft steel bars, base, per lb.	2.00c. to 2.10c.
Refined iron bars, base, per lb.	2.60c.

Hot-Rolled Flats	
Hoops, base, per lb.	2.90c. to 3.00c.
Bands, base, per lb.	2.90c. to 3.00c.
Strips, base, per lb.	2.90c. to 3.00c.
Cotton ties, per bundle of 45 lb.	\$1.14

Cold-Finished Steels	
Bars and shafting, base, per lb.	2.50c.
Strips, base, per lb.	4.50c.

Wire Products	
Nails, base, per keg.	\$2.70
Bright plain wire, base, per 100 lb.	2.45
Annealed fence wire, base, per 100 lb.	2.45
Galvanized wire, base, per 100 lb.	2.95
Galvanized barbed, base, per 100 lb.	3.35
Galvanized staples, base, per keg.	3.35
Painted barbed wire, base, per 100 lb.	3.00
Polished staples, base, per keg.	3.00
Cement coated nails, base, per count keg.	2.20
Woven fence, carloads (to jobbers)	70% per cent off list
Woven fence, carloads (to retailers)	68 per cent off list

Bolts and Nuts	
Machine bolts, small, rolled threads.	60 and 5 per cent off list
Machine bolts, small, cut threads.	50 and 10 per cent off list
Machine bolts, larger and longer.	50 and 10 per cent off list
Carriage bolts, 5/8 x 6 in.	
Smaller and shorter, rolled threads.	

50, 10 and 5 per cent off list	
Cut threads	50 per cent off list
Longer and larger sizes.	50 per cent off list
Lag bolts	60 and 5 per cent off list
Plow bolts, Nos. 1, 2 and 3 heads.	50 and 10 per cent off list
Other style heads.	20 per cent extra
Machine bolts, c.p.c. and t. nuts, 5/8 x 4 in.	
Smaller and shorter.	45 per cent off list
Larger and longer sizes.	45 per cent off list
Hot pressed square or hex. blank nuts.	\$3.25 to \$3.50 off list
Hot pressed nuts, tapped.	3.25 to 3.50 off list
C.p.c. and t. sq. or hex. nuts, blank.	3.25 to 3.50 off list
C.p.c. and t. sq. or hex. nuts, tapped.	3.25 to 3.50 off list
Self-finished hex. nuts:	
9/16 in. and smaller, U. S. S.	75, 10 and 5 per cent off list
5/8 in. and larger, U. S. S.	70, 10 and 2 1/2 per cent off list
Small sizes, S. A. E.	80 and 5 per cent off list
S. A. E., 5/8 in. and larger.	75 and 5 per cent off list
Stove bolts in packages.	80 and 5 per cent off list
Stove bolts in bulk.	80, 5 and 2 1/2 per cent off list
Tire bolts	50, 10 and 10 per cent off list

Cap and Set Screws	
Milled square and hex. head cap screw.	75 per cent off list
Milled set screws.	75 per cent off list
Upset cap screws.	75 and 10 per cent off list
Upset set screws.	80 per cent off list

Rivets	
Large structural and ship rivets, base, per 100 lb.	\$3.15
Large boiler rivets, base, per 100 lb.	3.25
Small rivets	65 per cent off list

Track Equipment	
Spikes, 9/16 in. and larger, base, per 100 lb.	\$2.75 to \$2.85
Spikes, 1/2 in. and smaller, base, per 100 lb.	3.50
Spikes, boat and barge, base, per 100 lb.	3.50
Track bolts, base, per 100 lb.	3.85 to 4.50
Tie plates, per 100 lb.	2.35 to 2.50
Angle bars, base, per 100 lb.	2.75

Welded Pipe	
Butt Weld	
Inches	Steel
1/4	49
1/2	55
3/4	60
1	64
1 1/2	66
Inches	Black
1/4	23 1/2
1/2	29 1/2
3/4	46 1/2
1	52 1/2
1 1/2	54 1/2
Inches	Iron
1/4 to 3/8	+ 7
1/2	26
3/4	32
1 to 1 1/2	34

Lap Weld	
2	59
2 1/2 to 6	63
7 to 8	60
9 to 12	59
47 1/2	29
51 1/2	32 1/2
47 1/2	30
46 1/2	17

Butt Weld extra strong, plain ends	
1/4 to 3/8	45
1/2 to 3/4	51
3/4 to 1	57
1 to 1 1/2	62
1 1/2 to 2	64
2 to 3	65
28 1/2	15
34 1/2	18
46 1/2	18
51 1/2	20
53 1/2	
54 1/2	

Lap Weld, extra strong, plain ends	
2	57
2 1/2 to 4	61
4 1/2 to 6	60
7 to 8	56
9 to 12	50
46 1/2	30
50 1/2	21
49 1/2	20
43 1/2	13
37 1/2	8

To the large jobbing trade the above discounts are increased by one point, with supplementary discounts of 5 and 2 1/2 per cent.

Boiler Tubes	
Lap Welded Steel	
1 1/4 in.	21 1/2
2 to 2 1/4 in.	36
2 1/2 to 3 in.	47
3 1/4 to 13 in.	52
Charcoal Iron	
1 1/4 in.	+ 7
1 1/4 to 1 1/2 in.	3
2 to 2 1/4 in.	13
2 1/2 to 3 in.	18
3 1/4 to 4 1/2 in.	20

To large buyers of steel tubes a supplementary discount of 5 per cent is allowed.

Standard Commercial Seamless Boiler Tubes
Discounts on cold-drawn tubes in carload lots, f.o.b. Pittsburgh, follow:

1 in.	55
1 1/4 and 1 1/2 in.	47
1 3/4 in.	31
2 and 2 1/4 in.	34
2 1/2 and 2 3/4 in.	38
3 in.	42
3 1/4 to 4 in.	47
4 1/4 in. and 5 in.	39

Hot Rolled
3 in. 44 | 3 1/4 to 4 in. 49
Less carloads, 4 points less. Add \$8 per net ton for more than four gages heavier than standard. No extras for lengths up to and including 24 ft. Sizes smaller than 1 in. and lighter than standard gage to be sold at mechanical tube list and discount. Intermediate sizes and gages not listed take price of next larger outside diameter and heavier gage.

Seamless Mechanical Tubing
Carbon under 0.30, base. 85 per cent off list
Carbon 0.30 to 0.40, base. 83 per cent off list
Plus usual differentials and extras for cutting.

Seamless Locomotive and Superheater Tubes	
Cents per Ft.	Cents per Ft.
2-in. O.D. 12 gage.	14
2-in. O.D. 11 gage.	15
2-in. O.D. 10 gage.	16
2 1/4-in. O.D. 12 gage.	16
2 1/4-in. O.D. 11 gage.	17
2 1/4-in. O.D. 10 gage.	19
3-in. O.D. 7 gage.	34
1 1/2-in. O.D. 9 gage.	13 1/2
5/8-in. O.D. 9 gage.	53
5/8-in. O.D. 9 gage.	55

Tin Plate	
Standard cokes, per base box.	\$4.75

Terne Plate	
(Per package, 200-lb.)	
8-lb. coating	\$9.30
8-lb. coating I. C.	9.60
15-lb. coating I. C.	11.80
20-lb. coating I. C.	13.00
25-lb. coating I. C.	\$14.25
30-lb. coating I. C.	15.25
35-lb. coating I. C.	16.25
40-lb. coating I. C.	17.25

Sheets	
Blue Annealed	
Nos. 9 and 10 (base), per lb.	2.50c. to 2.75c.
Box Annealed, One Pass Cold Rolled	
No. 28 (base), per lb.	3.35c. to 3.50c.
Regular auto body sheets, base, per lb.	4.75c. to 5.00c.
Galvanized	
No. 28 (base), per lb.	4.35c. to 4.60c.
Tin-Mill Black Plate	
No. 28 (base), per lb.	3.35c. to 3.50c.
Manufacturers have pamphlets, which can be had upon application, giving price differentials for gage and extras for length, width, shearing, etc.	

Freight Rates

All rail freight rates from Pittsburgh on finished iron and steel products, in carload lots, to points named, per 100 lb., are as follows:

Philadelphia, domestic.	\$0.325	Buffalo	\$0.265	St. Louis	\$0.43	Pacific Coast	\$1.50
Philadelphia, export.	0.235	Cleveland	0.215	Kansas City	0.735	Pac. Coast, ship plates	1.20
Baltimore, domestic.	0.315	Cleveland, Youngstown		Kansas City (pipe)	0.705	Birmingham	0.69
Baltimore, export.	0.225	Comb.	0.19	St. Paul	0.595	Memphis	0.385
New York, domestic.	0.34	Detroit	0.295	Omaha	0.735	Jacksonville, all rail.	0.50
New York, export.	0.255	Cincinnati	0.295	Omaha (pipe)	0.705	Jacksonville, rail and water	0.415
Boston, domestic	0.365	Indianapolis	0.31	Denver	1.275	New Orleans	0.515
Boston, export	0.255	Chicago	0.34	Denver (pipe)	1.215		

The minimum carload to most of the foregoing points is 36,000 lb. To Denver the minimum loading is 40,000 lb., while to the Pacific Coast on all iron and steel products, except structural material, the minimum is 80,000 lb. On the latter item the rate applies to a minimum of 50,000 lb., and there is an extra charge of 9c. per 100 lb. on carloads of a minimum of 40,000 lb. On shipments of wrought iron and steel pipe to Kansas City, St. Paul, Omaha and Denver the minimum carload is 46,000 lb. On iron and steel items not noted above the rates vary somewhat and are given in detail in the regular railroad tariffs.

Rates from Atlantic Coast ports (i.e., New York, Philadelphia and Baltimore) to Pacific Coast ports of call on most steamship lines, via the Panama Canal, are as follows: Pig iron, 30c. to 40c.; ship plates, 30c. to 40c.; ingot and muck bars, structural steel, common wire products, including cut or wire nails, spikes and wire hoops, 30c. to 40c.; sheets and tin plates, 50c.; rods, wire rope cable and strands, 75c.; wire fencing, netting and stretcher, 50c.; pipe, not over 8 in. in diameter, 50c.; over 8 in. in diameter, 2 1/2c. per in. or fraction thereof additional. All prices per 100 lb. in carload lots, minimum 40,000 lb.

FABRICATED STEEL BUSINESS

Fresh Inquiries Double the Tonnage of Awards of the Week

Among the fabricated steel awards of the past week are the following:

Three buildings for the Sirup Products Co., Yonkers, N. Y., 300 tons, to Bancroft & Jones.

Beach Channel bridge, Borough of Queens, New York, 370 tons, to Bethlehem Steel Bridge Corporation.

Bridge construction for the Baltimore & Ohio Railroad, 2500 tons, to McClintic-Marshall Co., as indicated last week.

Transit Commission car shops on East 148th Street, New York, to be used by Interborough Rapid Transit Co., 3300 tons, to Bethlehem Steel Bridge Corporation, as indicated last week.

Apartment building at Lexington Avenue and Ninety-third Street, New York, 600 tons, to Hinkle Iron Works.

Building for *Brooklyn Daily Eagle*, Brooklyn, 200 tons, to Hedden Iron Construction Co.

Allerton House, Chicago, 2450 tons, to Bethlehem Steel Bridge Corporation.

Broderick & Bascom Rope Co., building, St. Louis, 633 tons, to St. Louis Structural Steel Co.

Chicago Mill & Lumber Co., plant, Chicago, 400 tons, to Kenwood Bridge Co.

Burnham Boiler Co., foundry, Lancaster, Pa., 600 tons, to Lancaster Steel & Foundry Co.

Masonic Temple, Butte, Mont., 340 tons, to Minneapolis Steel & Machinery Co.

Tama County, Iowa, bridges, 175 tons, to Clinton Bridge Works.

Missouri Pacific Railroad, one 80-ft. and two 60-ft. deck plate girder spans, 118 tons, to Virginia Bridge & Iron Co.

Highway bridge over Lake Erie & Western tracks, Lima, Ohio, 600 tons, to American Bridge Co.

Highway bridge, Hamilton County, Ohio, 100 tons, to a Cincinnati fabricator.

Machine shop building, Neely Nut & Bolt Co., Pittsburgh, 250 tons, to McClintic-Marshall Co.

Addition to Tuller Hotel, Detroit, 700 tons, to Riverside Bridge Co.

Addition to Seneca Hotel, Rochester, N. Y., 750 tons, to Genessee Bridge Co., low bidder for steel delivered, and A. E. Norton, Inc., New York, low bidder for steel delivered and erected.

Structural Projects Pending

Inquiries for structural steel work now being figured on include the following:

Mecca Temple, Shriners, Sixth Avenue, between Fifty-fifth and Fifty-sixth Streets, New York, 2500 tons.

Salaam Temple, Shriners, Newark, 1000 to 1500 tons.

Subway construction in Borough of Queens, New York, 2700 tons; bids received.

Carpenter Building, Grand Avenue and Sixth Street, Milwaukee, 1250 tons.

Addition to Peoples Trust & Savings Bank, Chicago, 700 tons.

Produce & Refiners Corporation, ten 55,000-bbl. oil storage tanks for Fort Steele, near Rawlins, Wyo., 3000 tons.

Plant for Chevrolet Motor Co., Cincinnati, approximately 1200 tons, bids close Nov. 7.

Horses and props, Dam 32, Ohio River, 450 tons, proposals received until Nov. 20 by U. S. Engineers' Office, Huntington, W. Va.

City pumping station, Cleveland, 1500 tons.

Longfellow School, Cleveland, 150 tons.

General Tire & Rubber Co., Akron, plant addition, 160 tons.

Two Box Car Orders

WASHINGTON, Oct. 31.—The order of the car service division of the American Railway Association made public yesterday, which instructs railroads in the Northwest, Central Western and Southwestern districts to return at once box cars which are now on their lines but which belong to Eastern roads, follows the one issued earlier in the week by the railroads situated east of Chicago and Peoria, Ill., and St. Louis, which were instructed to send west immediately all box cars to Western roads in order to enable Western agricultural States to meet the box car shortage.

RAILROAD EQUIPMENT BUYING

Fresh Inquiries Call for About 10,000 Freight Cars—93 Locomotives Bought

Fresh inquiries add about 9600 freight cars to the railroad equipment now under negotiation. Some 1350 cars and 93 locomotives have been ordered. Some of the items are as follows:

The Illinois Central Railroad has ordered 85 Mikado locomotives from the Lima Locomotive Co.

The Maine Central Railroad has ordered 8 ten-wheel switching engines from the Lima Locomotive Co.

The Northern Pacific has canceled its inquiry for 15 switch engines but is still in the market for 49 locomotives of other types.

The Soo line has placed 500 box and 250 gondola cars with the Pullman Co. and 500 box cars with the American Car & Foundry Co.

The Denver & Rio Grande is inquiring for 800 gondola cars and 1000 stock cars.

The Great Northern is in the market for 5900 cars of various types.

The St. Louis Southwestern is inquiring for 500 box, 500 automobile and 200 ballast cars.

The Rock Island has let repairs on 5 dining cars to the Pullman Co.

The inquiry of the Chicago, Milwaukee & St. Paul Railroad, mentioned last week, has been increased to 7000 50-ton composite gondolas and 3000 40-ton box cars.

The Cotton Belt Railroad is inquiring for 500 box cars and 200 gondolas.

The Lehigh & New England Railroad had ordered 100 composite gondolas from the Magor Car Corporation.

The Norfolk & Western Railroad has placed an order for four double-cab electric locomotives similar to, but of greater capacity, than those now on the Elkhorn grade electrification. The new locomotives will be equipped for operation over the alternating current installation and will be of the jack shaft and side rod type of locomotive weighing approximately 382 tons.

The Pennsylvania Equipment Co. is in the market for a second-hand Mogul engine of 65 tons weight and two cafe-observation cars.

The Lion Oil & Refining Co., Kansas City, Mo., is in the market for 9 oil tanks of 2000 and 10,000 bbl. capacity, 6 1000-bbl. stills and other equipment for its refinery at Pearson, Ark.

Brown Coal Briquettes for Producer Gas

WASHINGTON, Oct. 31.—Returning recently from a trip of three months in European countries to study the lignite industry in connection with an investigation authorized by Congress, O. P. Hood, chief mechanical engineer of the Bureau of Mines, made some observations to THE IRON AGE which are of interest to the iron and steel industry.

"I found where producer gas was used," said Mr. Hood, "that it is entirely possible to use brown coal briquettes. Even with an admixture with some raw brown coal I found a great deal of fuel of this sort used for that purpose, particularly in Germany.

"It is interesting for Americans to note that briquettes are readily accepted in the family of fuels, while we think of them as something special or extraordinary, or in the nature of experiment. The increase in the price of fuel will no doubt bring us to the same condition where briquettes of fine coal or even of special fuels will be more readily accepted as standard fuel. One finds English block briquettes widely distributed and in use, especially on European railroads.

"Our boiler room and fuel practice in its best expression is just as good as anything I observed in Europe, but it seemed to me that good firing and attention to good combustion was more universally practiced, especially in the smaller plants than with us. European firemen will get good results from a fuel that our firemen would reject as impossible."

Countries visited by Mr. Hood included England, Belgium, Germany, Czecho-Slovakia, Switzerland, Italy and France.

Shenango works (tin plate), American Sheet & Tin Plate Co., New Castle, Pa., is running full.

NON-FERROUS METALS

The Week's Prices

Cents Per Pound for Early Delivery							
Copper, New York Straits		Tin		Lead		Zinc	
Lake	Electro-lytic*	New York	New York	St. Louis	New York	St. Louis	
Oct. 25.....	14.12½	13.62½	35.75	6.75	6.45	7.35	7.00
26.....	14.12½	13.50	35.95	6.80	6.50	7.45	7.10
27.....	14.12½	13.50	36.87½	6.80	6.50	7.45	7.10
28.....	14.12½	13.50	6.80	6.50	7.45	7.10
30.....	14.12½	13.62½	37.37½	6.80	6.50	7.45	7.10
31.....	14.12½	13.62½	37.00	6.80	6.50	7.45	7.10

*Refinery quotation.

New York

NEW YORK, Oct. 31.

Buying of the metals is not active. With the exception of copper prices have advanced. The electrolytic copper market is quiet. Prices of tin have reached the highest level of the year and quotations of lead and zinc have advanced during the week.

Copper.—Because of the fact that electrolytic copper has been available from one or two sources at 13.75c., delivered, the market has turned quiet and inactive, due to a natural cautiousness on the part of consumers. The actual amount of metal available at the above price is small relatively, and, if the demand were large, it could not be satisfied at less than 13.87½c., delivered, and some sellers will not sell below 14c., delivered. The situation is somewhat mixed, but the broad market may be quoted at 13.62½c., refinery, or 13.87½c., delivered, for deliveries extending into the first of the year. Lake copper is quoted at 14c. to 14.25c., delivered.

Copper Averages.—The average price of Lake copper for the month of October, based on daily quotations in THE IRON AGE, was 14.14c. The average price of electrolytic copper was 13.65½c., refinery, or 13.90½c., delivered.

Tin.—Sharp advances in the price of Straits tin, to the highest levels of the year, have again been recorded, due largely to the highly speculative London market. In the last week the British market has advanced nearly £10 per ton, so that to-day spot standard was quoted at £184, future standard at £184 10s. and spot Straits at £185 7s. 6d. Despite the character of the market abroad buyers here are not panicky. It is the opinion of some that consuming demand will diminish in the near future rather than increase. The quiet market early last week, noted in this report a week ago, continued until last Thursday when sales of about 300 tons were made, mostly nearby delivery, at 35.87½c. to 36c., with dealers the heaviest buyers. The New York market to-day has been dull and weak, with spot Straits tin quoted at 37c., New York. A report in the trade yesterday to the effect that an American option had been obtained on the government stocks of tin in the Far East created considerable of a flurry, but an analysis of the entire situation and denials by several American interests who might be able to obtain this option rendered the rumor as unworthy of serious consideration. Arrivals thus far this month have been 7201 tons, with 7325 tons reported afloat. Estimates in the trade are to the effect that deliveries into consumption for October will total about 5100 tons.

Lead.—The market is fairly firm and very little metal is available for November delivery. The situation is as tight as it has been at any time. The leading interest has not yet changed its quotations which still stand at 6.30c., St. Louis, and 6.50c., New York, but the outside market is very much stronger at 6.50c., St. Louis, and 6.80c., New York. For delivery at Eastern points business has been done in small lots at 6.82½c., New York, for early delivery.

Zinc.—Prices have again advanced, largely due to the statistical situation, and prime Western for early delivery is now quoted at 7.10c., St. Louis, or 7.45c., New York, the highest prices of the year. New business is light, but the situation regarding exports is

brighter and some sellers report business already done for export to England where the metal is reported to be scarcer than on this side.

Antimony.—Wholesale lots of Chinese metal for early delivery are quoted at 6.70c., New York, duty paid.

Aluminum.—Virgin metal, 98 to 99 per cent pure, made by foreign producers is obtainable from foreign importers at 20c. to 21c. per lb., duty paid, but the leading American producer has not yet made public the basis on which it is doing business.

Old Metals.—Red metals are quiet but white metals continue active. Dealers' selling prices are as follows:

	Cents Per Lb.
Copper, heavy and crucible.....	13.375
Copper, heavy and wire.....	12.50
Copper, light and bottoms.....	11.25
Heavy machine composition.....	10.50
Brass, heavy.....	8.25
Brass, light.....	6.50
No. 1 red brass or composition turnings..	9.50
No. 1 yellow rod brass turnings.....	7.50
Lead, heavy.....	5.50
Lead, tea.....	4.00
Zinc.....	4.25

Chicago

OCT. 31.—Tin, lead and spelter have again advanced, although in this territory business in three metals has been rather light. Old grades of zinc and tin have advanced in sympathy with the new metals. We quote, in carload lots, lake copper, 14.37½c.; tin, 38c. to 39c.; lead, 6.62½c.; spelter, 7.25c.; antimony, 8.50c., in less than carload lots. On old metals we quote copper wire, crucible shapes and copper clips, 11.50c.; copper bottoms, 9.75c.; red brass, 9c.; yellow brass, 7c.; lead pipe, 4.87½c.; zinc, 4.75c.; pewter, No. 1, 23c.; tin foil, 26c.; block tin, 30c., all buying prices for less than carload lots.

St. Louis

OCT. 31.—Lead for the week was higher at 6.40c. to 6.45c., car lots, while slab zinc was up 20 points at 7c. to 7.05c. On old metals we quote: Light brass, 3.50c.; heavy red brass and light copper, 7c.; heavy yellow brass, 4c.; heavy copper and copper wire, 7.50c.; zinc, 2c.; pewter, 15c.; tin foil, 20c.; tea lead, 2c., and aluminum, 9c.

Continued Improvement in the Connellsville Region

UNIONTOWN, PA., Oct. 29.—Output in the Connellsville bituminous region lacked, for the week ending Oct. 21, only 3000 tons of reaching the pre-strike production. A gain of 6000 tons over the preceding week was made. Total production was 146,720 tons.

Four plants added 559 ovens to the active list during the week. The principal retarding influence in the regional production is a shortage of cars. No improvement has been made on the Baltimore & Ohio and during the week the Pennsylvania placements were below the average for the past several weeks. For instance, the combined movement of coal and coke loads over the Pennsylvania Railroad during the week was 7779 cars, a loss of 1200 cars from the previous week. Plants added to the active list during the week were Washington Coal & Coke Co., No. 2 plant; Century plant of the Century Coke Co., and Garwood and Peerless plants. The H. C. Frick Coke Co. added 170 more ovens to its active list. Ovens in operation in the region now are 12,889, as compared to 4860 for the same week of last year.

The strike situation has ceased to be a factor in the output of the region. Strikers are preparing for the winter. In some instances wooden shacks are being built. In one small shack in the region it is reported that 35 families are housed in one great room.

The Paige Motor Car Co. has acquired the plant formerly occupied by the Hinkley Motors Corporation on West Fort Street at Twenty-fourth Street, Detroit, giving the Paige Company four plant units. The Hinkley Motors Corporation has moved to its new plant in Ecorse, Mich.

PERSONAL

Charles F. Morse, corporation attorney, Chicago, has been elected president Dodge Sales & Engineering Co., Mishawaka, Ind. William W. Dodge, who holds a controlling interest in the company, has been elected vice-president. Among officers who have resigned are Melville W. Mix, president; W. B. Hosford, vice-president; Charles Endlich, treasurer; W. L. Chandler, assistant treasurer, and Harry Bell, foundry superintendent.

John A. Camm, president Western Iron Stores Co., Milwaukee, was tendered a formal dinner on Oct. 23, by the officers and department executives of the Kearney & Trecker Corporation, Milwaukee, from which he retired as sales manager on Aug. 1.

B. F. Phillopon, president Climax Molybdenum Co., 61 Broadway, New York, sailed on the *Majestic* on Oct. 29 for France where he will spend four or five weeks on business.

Frank W. Wirfs, until recently sales manager of the Power Equipment Co., Minneapolis, Minn., has joined the sales force of the Chicago Belting Co., Chicago. He will be located in Minneapolis covering contiguous territory where he has a considerable acquaintance among mill supply buyers. After leaving the University of Washington, he conducted mills of his own at Canby and Dayton, Ore. Later he was salesman for A. H. Averil & Co., Portland, Ore., jobbers of mill and threshing machinery. Then he spent five years as marine engineer with the Merchant Marine, joining the Power Equipment Co. as sales manager at the close of the war.

At a recent meeting of the directors of Foster, Merriam & Co., manufacturers of hardware, Meriden, Conn., Reginald W. Millard, president, and John A. Ross, treasurer, resigned their positions to take effect immediately. The directors have elected Howard E. Boardman, New York as the new president. Mr. Boardman has been a director for some time. Nelson C. Johnson, secretary of the company, has been chosen treasurer to succeed Mr. Ross, at the same time retaining his duties as secretary. Albert W. Savage was elected member of the board to fill a vacancy.

C. C. Strout, formerly connected with the Victor Saw Works as western sales manager, and with the Safety Wrench & Appliance Co. as general sales manager, has been appointed vice-president in charge of sales of the Alvord Reamer & Tool Co., Millersburg, Pa.

John T. Hill, formerly president of R. C. Hoffman & Co., Inc., has organized John T. Hill & Co., Inc., rails, sheets, bars and shapes, 1318 Continental Building, Baltimore, Md.

Guy W. Donahue has resigned as president and general sales manager of the Victor Saw Works, Inc., Middletown, N. Y., to organize the Dolman Mfg. Co., Inc., in conjunction with two former associates: William F. Pollock, formerly general manager, and Chester C. Jackman, formerly factory manager of the Victor Saw Works. The new company which is located at Springfield, Mass., will engage in the manufacture of tools.

Glenn W. Norris, formerly in the Pittsburgh district office, Youngstown Sheet & Tube Co., and subsequently a member of the sales force, Liberty Steel Products Co., Cleveland, and the Iron Trade Products Co., Pittsburgh, has become affiliated with W. C. Runyon & Co., First National Bank Building, Pittsburgh, as salesman. The firm is sales agent of the Struthers Furnace Co., Struthers, Ohio, and also does a coal and coke business.

Roy A. MacDonald, formerly attached to the Pittsburgh district sales office, General Refractories Co., has been placed in charge of the recently created Cleveland district of that company, with offices at 1126 Leader-News building, Cleveland. Mr. MacDonald, after leaving Penn State College, spent about eight years as a construction engineer at blast furnace and steel works plants in the Pittsburgh and Youngstown districts. He

was associated with the Harbison-Walker Refractories Co., Pittsburgh, for a few years, leaving that company to join the General Refractories Co. at its formation in 1911. George A. Forbes, formerly with the Pennsylvania Fire Brick Co., will be associated with Mr. MacDonald.

H. B. Bole resigned as first vice-president of the Hydraulic Steel Co., Cleveland, at the annual meeting on Oct. 27. He will remain as a member of the board of directors.

L. W. Fischer, Chicago, secretary National Metal Trades Association, spoke on the Landis award in the building industry of Chicago at the first fall meeting of the Executives' Club, Worcester, Mass., held Friday evening, Oct. 27.

Benjamin G. Lammé, chief engineer Westinghouse Electric & Mfg. Co., has been awarded the Joseph Sullivant medal of Ohio State University, in recognition of his engineering achievements. Mr. Lammé is a graduate of the Ohio institution. He is the first to receive the Sullivant medal, which is awarded only once in five years to a graduate of the university for outstanding accomplishments in his chosen work.

G. Ernest Wells, director Edgar Allen & Co., Ltd., Sheffield, England, is in the United States visiting the Western and Eastern offices of the Edgar Allen Steel Co., Inc., 86 John Street, New York.

F. P. Hammes has succeeded to the position of production manager D. J. Ryan Foundry Co., Ecorse, Mich. The position was held previously by the late James F. Flynn.

W. R. Marvin has succeeded L. E. Woodsend as general manager, Valley Foundry & Machine Works, Inc., 710-732 H Street, Fresno, Calif.

H. J. Stambaugh, formerly vice-president and general manager Trussed Concrete Steel Co. of Canada, Ltd., Walkerville, Ont., has been appointed general sales manager of the Burlington Steel Co., Ltd., Hamilton, Ont.

W. W. Lukens, former president of the Alan Wood Iron & Steel Co., Philadelphia, has returned from an extended stay in Europe.

George C. Davies, vice-president Pilling & Co., pig iron merchants, Philadelphia, has returned from a stay of two months in England.

Richard Knight, New York office of the McClintic-Marshall Co., has returned from a sojourn of five weeks in England.

OBITUARY

CHARLES E. GLOVER, an active and prominent Connecticut manufacturer, died on Oct. 25 in New Britain, following a long illness. He was in his 75th year. Mr. Glover was perhaps best known as president of the Corbin Screw Corporation, being the executive head of that company from 1902 until March, 1921, when he resigned. During his business life Mr. Glover was a director of the American Hardware Corporation, president of the Skinner Chuck Co., president of the H. R. Walker Co.; president of the D. C. Judd Co.; and served as a director of the New Britain National Bank, North & Judd Co., Aetna Nut Co., and the New Britain General Hospital. A native of Nottingham, England, where he was born June 16, 1847, he was brought to Connecticut as a child. During the Civil War, he worked in his father's machine shop, and at the age of 20 secured employment with the National Screw Co. Nine years later, Mr. Glover became associated with the P. & F. Corbin Co., New Britain, his first duty being to supervise the installation of screw making machinery in the company's new plant. In 1902, when the P. & F. Corbin Co. consolidated with Russel & Erwin to form the American Hardware Corporation, Mr. Glover was made president of the Corbin Screw Corporation.

CHESTER R. BAIRD, formerly of the Baird Furnace Co., operating in the Hocking Valley in Ohio, died at

St. Vincent's Hospital, New York, on Oct. 17, aged 56. Some 30 years ago he was a member of the firm of Chamberlain, Turney & Baird, Columbus, Ohio. Later he engaged in the iron business in Philadelphia and for the past 15 years resided in New York. He was president of a company manufacturing motion picture machines.

A. J. BEATON, of the Beaton & Cadwell Mfg. Co., manufacturer of metal goods, air valves, and plumbing goods, New Britain, Conn., died on Oct. 21, at Norwood, Mass., aged 74.

WILLIAM BLAKE WOOD, president Gifford-Wood Co., Hudson, N. Y., died on Oct. 28 at the Albany City Hospital, after a two-weeks illness. Mr. Wood was born in Arlington, Mass., July 15, 1869. He became a member of the firm of William T. Wood & Co., Arlington, upon the death of his father Cyrus Wood, in 1896, and continued as a partner with William E. Wood, and later became a member of the Gifford-Wood Co. incorporated in 1905. He moved with his family to Hudson in 1911 and succeeded Malcolm Gifford as president upon the latter's death in 1919.

RICHARD T. PULLEN, 73 years old, former president of the Herring-Hall-Marvin Safe Co., Hamilton, Ohio, died in New York on Oct. 27. At the time of his death he was president of the Remington-Sherman Safe Co., New York.

PHILLIP C. WALSH, JR., president Walsh Sons & Co., iron and steel merchants, Newark, N. J., died at his home, in that city, on Oct. 28. Mr. Walsh spent a lifetime in the iron and steel business and was held in high regard. He was connected with several business corporations and was at one time president of the Waste Trade Dealers' Association. A son, Philip C. Walsh, 3rd, is general manager of the National Steel Rolling Co., New York.

WARREN KELLY, president O. S. Kelly Co., piano plate manufacturer, Springfield, Ohio, died at his home last Tuesday morning after an illness of several months. He was born in Springfield 71 years ago. Mr. Kelly's father, the late Oliver S. Kelly, was at one time mayor of Springfield and a prominent manufacturer for many years.

JOHN BERGOYNE FOOTE, president and treasurer of Foote Brothers Gear & Machine Co., Chicago, whose sudden death on Oct. 12 was announced in this column on Oct. 19, was an inventor of numerous automatic machines for making cams and a pioneer in inventions pertaining to the light weight type of farm tractor. He began at the age of 14 as a die setter for the Chicago Stamping Co. From 1893 to 1904 he was a partner with D. O. James in the firm of James & Foote, manufacturers of cut gears. In 1904 a disastrous fire wiped out all but the goodwill of the concern and then he organized the Foote Brothers Gear & Machine Co. He was a director of the Barton spider web reinforced concrete system; president and director Illinois Tractor Co.; treasurer American Tractor Association; director of American Gear Manufacturers' Association and member Society of Automotive Engineers. His brother, Bradford Foote, will continue the business of the Foote company.

Detroit Scrap Firm

DETROIT, Oct. 31.—Detroit producers report that they are able to ship a large proportion on their scrap commitments due to the fact that in most cases they are receiving some cars on incoming materials which can be loaded out. The market, while below the high point of the year, has a tendency to firmness. The following prices are on a gross ton basis, f.o.b. cars producers' yards, excepting stove plate, automobile and No. 1 machinery cast, which are quoted on a net ton basis:

Heavy melting steel.....	\$16.00 to \$17.00
Shoveling steel	16.00 to 17.00
No. 1 machinery cast.....	21.00 to 23.00
Cast borings	13.00 to 14.00
Automobile cast scrap.....	23.00 to 25.00
Stove plate	21.00 to 23.00
Hydraulic compressed	16.50 to 17.50
Car wheels	21.00 to 22.00

Use of Oxygen in Blast Furnace and Metallurgical Operations

Use of oxygen in connection with the enrichment of the blast in the blast furnace and in practically all phases of pyro-metallurgical work will furnish the key to success in the further development of such metallurgical operations, according to Dr. F. G. Cottrell, formerly director and now consulting metallurgist of the U. S. Bureau of Mines, who first directed the bureau's attention to this subject. Through this enrichment process, it is hoped to increase the efficiency of metallurgical operation with a resultant production of metals at lower cost and possibly the use of lower grade ores.

The Bureau of Mines now has outlined plans for two studies which will be carried on simultaneously. The first will cover the present-day processes for the production of oxygen, in order to determine the feasibility of attempting to produce oxygen, or oxygenated air, in such amounts and at such a cost as to permit of its use in metallurgical operations. The second study will be devoted to the feasibility of using oxygen, or oxygenated air, in metallurgical operations.

Because of his interest in this investigation, M. H. Roberts, vice-president Franklin Railway Supply Co., was asked to select an advisory committee to work with the Bureau of Mines and to act as chairman of this committee. The committee will consist of Dr. F. G. Cottrell, director Fixed Nitrogen Research Laboratory; Prof. W. L. DeBaufre, chairman mechanical engineering department of the University of Nebraska; Dr. D. A. Lyon, chief metallurgist Bureau of Mines; Dr. R. B. Moore, chief chemist Bureau of Mines; Dr. R. C. Tolman, professor of physical chemistry and mathematical physics, California Institute of Technology; J. W. Davis, mechanical engineer Bureau of Mines; F. W. Davis, metallurgist Bureau of Mines; Frank Hodson, president of the Electric Furnace Construction Co., Philadelphia, and P. H. Royster, assistant metallurgist Bureau of Mines.

Previous to the war, some work was done in Belgium on the enrichment of the blast with oxygen in connection with the smelting of iron ores in the blast furnace. In the United States the late J. E. Johnson, Jr., was interested in the possible use of oxygen in metallurgical operations and carried on some experimental work along these lines previous to his death.

Common Labor Shortage in Pennsylvania Less Acute

The semi-monthly report of the Pennsylvania State Department of Labor and Industry discloses that as of Oct. 15, there were 10,000 fewer unemployed than on Oct. 1. The total number of unemployed on Oct. 15, is estimated to have been 40,680, exclusive of those on strike. This is regarded as an unusually favorable situation in view of the fact that normally there is a floating army of 50,000 workmen, either unable to find work or unwilling to accept employment. While a shortage of men in both skilled and unskilled positions in some lines is reported, the supply of the latter is becoming more plentiful. Many farmers have released summer help and the completion of several large contract projects has helped to relieve the acute shortage of common labor.

A 60,000-kw. power plant is to be built by the Edison Electric Illuminating Co., of Boston, and the construction and engineering of the work has been put in the hands of Stone & Webster, Inc., Boston, under the supervision of I. E. Moulthrop of the Edison company. The plans contemplate an ultimate capacity for the station of 300,000 kw. The plant will be built on the Fore River at Weymouth, with arrangements for bringing coal by water through a ship channel. The preliminary plans call for an initial installation of two 30,000-kw. turbine units.

British Iron and Steel Market

American Inquiry for Pig Iron Stagnant—Large American Structural Inquiry—Continental Market Weaker

(By Cable)

LONDON, ENGLAND, Oct. 31.

Fresh American demand for pig iron is practically stagnant, but substantial quantities are still due for shipment and in consequence makers are but slightly perturbed, owing to the limited output and more buying for the home account. Hematite is firm with scarcity of prompt shipments. Makers are well booked.

Foreign ore is quiet with best Bilbao Rubio nominally at 23s. and North African ore selling at 21s., both ex-ship tees.

Finished iron and steel quotations are generally unchanged, but when business is offered competition is keen. General demand is broadening. The United States is inquiring for 20,000 tons of structural steel and the Colonial governments are placing substantial rail and bridge building contracts. The Clyde output in October was six vessels, a total of 54,570 tons. The Ebbw Vale dispute is ended and colliers have resumed work, but steel works are expected to remain idle the remainder of the year.

The Continental market is weaker, on exchanges; however, a fair business is being done. Germany has sold some good parcels of rails to Japan and minor tonnages of rails to India and the United States. Czecho-Slovakian open-hearth merchant bars have been sold at £6 19s., f.o.b., and Czecho-Slovakian beams at £7 2s. 6d., c.i.f. India. There is a good demand for wire nails, but supplies are scarce.

Tin plates are firmer. On speculative purchases on minimum basis, makers generally are asking more money. There is an improved export demand for tin plate, inquiries appearing from Canada, but no business is reported.

There is an improved demand for galvanized sheets, and the market is firmer on dear spelter. Japan continues to purchase good quantities of black sheets and Welsh works are generally booked until the end of the year. Prices are higher.

We quote per gross ton, except where otherwise stated, f.o.b. maker's works, with American equivalent figured at \$4.46 per £1, as follows:

Durham coke, delivered	£1 11s.		\$6.91
Cleveland No. 1 foundry	4 17½		21.74
Cleveland No. 3 foundry	4 12½	to £4 15s.	20.63 to \$21.18
Cleveland No. 4 foundry	4 10		20.07
Cleveland No. 4 forge.	4 5		18.955
Cleveland basic	4 6		17.84
East Coast mixed	4 12½	to 4 15	20.63 to 21.18
Ferromanganese	15 0		66.90
Ferromanganese*	14 10	to 14 15	20.07 to 21.18
Rails, 60 lb. and up...	7 5	to 8 0	32.33 to 35.68
Billets	7 2½	to 8 0	31.77 to 35.68
Sheet and tin plate bars,			
Welsh	7 0	to 7 7½	31.22 to 32.89
Tin plates, base box...	0 19¼	to 0 19½	4.29 to 4.35
			C. per Lb.
Ship plates	8 10	to 9 0	1.69 to 1.79
Boiler plates	11 10	to 12 0	2.29 to 2.39
Tees	9 0	to 9 10	1.79 to 1.89
Channels	8 5	to 8 15	1.64 to 1.74
Beams	8 5	to 8 15	1.64 to 1.74
Round bars, ¾ to 3 in.	9 0	to 9 10	1.79 to 1.89
Galvanized sheets, 24 g.	16 10	to 17 0	3.28 to 3.38
Black sheets, Japanese specifications	15 5		3.03
Steel hoops	11 0	& 11 10*	2.19 & 2.29*
Cold rolled steel strip, 20 g.	23 2½		4.60
Cotton ties, Indian specifications	15 0		2.98

*Export price.

Continental Prices, All F. O. B. Channel Ports, Delivery as Specified

No. 3 foundry pig iron:					
Belgium, Jan.	£4 2½	s. to £4 5s.		\$18.39 to \$18.95	
Luxemburg, Jan.	4 2½	to 4 5		18.39 to 18.95	
France, Jan.	4 2½	to 4 5		18.39 to 18.95	
Billets:					
France, Jan.	5 7½			23.97	
Luxemburg, Jan.	5 7½			23.97	
Lorraine, Jan.	5 7½			23.97	
Wire nails (keg basis):					
Germany	0 14½			3.23	
Belgium	0 20½			4.57	
Wire rods, 5 mm. (0.2 in.):					
Belgium	7 5	to 10 7½		32.33 to 46.27	
Angles:					
Belgium, Sept.	7 7½			C. per Lb. 1.46	
Tees:					
Belgium	8 5			1.64	
Merchant bars:					
Belgium, Jan.	6 17½	to 7 0		1.39 to 1.44	
Luxemburg, Jan.	7 0	to 7 2½		1.39 to 1.41	
France, Jan.	7 0	to 7 2½		1.39 to 1.46	
Germany, Dec., Jan.	6 0	to 6 5		1.39	
Joists (beams):					
France, Dec.	6 8	to 6 10		1.27 to 1.29	
Belgium, Dec.	6 8	to 6 10		1.27 to 1.29	
Luxemb'g, Dec., Jan.	6 5	to 6 10		1.24 to 1.29	
Channels:					
Belgium	7 10	to 7 12½		1.49 to 1.51	
¾-in. plates:					
Germany, Dec., Jan.	6 10	to 6 12½		1.44 to 1.31	
Belgium, Dec.	6 15	to 7 0		1.46 to 1.39	
Luxemburg, Dec.	6 15	to 7 0		1.44 to 1.39	
France, not offered.					
¾-in. plates:					
Germany	9 0			1.79	
No. 8 gage wire:					
Belgium	14 10½			2.89	

Fuel for Blast Furnaces Higher—Price for Tin Plate Bars Agreed on—A Steel Company Liquidates

LONDON, ENGLAND, Oct. 19—The pig iron market has continued firm with a moderate amount of general demand; supplies of the better grade are becoming scarce and Cleveland makers now require a month for delivery of substantial quantities. America has made a few fresh purchases but no great volume is involved. Quite large shipments are, however, still to be made to the United States and Canada, which will keep makers occupied for the rest of the year. Prices are undoubtedly high but there is as yet little hope for a general increase of output, as fuel prices are rising rapidly. Hematite has also shown a much firmer tendency on some revival of demand, for home consumers showed inclination to purchase this material while it was cheaper than foundry iron, but now the two grades have come into line and sellers quote both No. 3 G.M.B. and East Coast mixed numbers at about 92s 6d.

The position of finished iron and steel does not show much change though here and there there are signs of marked improvement. There are a few decent orders about, but the total is not large. Apart from these, however, Colonial governments have been placing some very substantial contracts for railroad material and home railroads are beginning to show more life. The London & North Western Railway Co. has just placed orders for 30 locomotives, at a cost of £15,000 each. It is hoped that the tin plate trade will revive now that some amicable agreement has been arrived at. Provided that tin plate makers are willing to maintain a minimum selling price of 19s 3d basis I. C. f.o.b., the Bar Makers Association agree to supply tin plate bars at £7. These arrangements have been agreed to by 93 per cent of the tin plate works, and a six months trial is to be given.

The Sheffield Steel Products Co. has gone into liquidation, Sir William B. Peat, of W. B. Peat & Co., being made receiver and manager on behalf of the debenture holders. An official circular issued by the company, gives reasons for this step, which, it is said, is due to the fact that the company has been suffering from lack of working capital and, now being advised of the commencement of proceedings by a number of creditors and with the difficulty of finding funds for the necessary raw material and wages, the directors themselves have suggested this course. The circular continues that the announcement does not indicate that the business will be closed, but that it will be carried on by the receiver and manager.

Preparing for Investigations Under Tariff (Concluded from page 1159)

part of Congress with an overwhelmingly complicated and difficult task. The instability resulting from rapidly changing economic conditions, not only in the United States but in foreign countries whose currencies are depreciated, the growing complexity of American industrial life, and the increasing burden on Congress of general tariff revisions, have led Congress at last to turn over to the President, with the co-operation of the Tariff Commission, the adjustment of individual tariff rates in accordance with a definite rule. Congress has saved the constitutional point by laying down the principle which is to guide the President in adjusting tariff rates, and has then provided a judicial method for finding the facts and for the application to them of the rule laid down.

"Another factor contributing to its enactment was a desire for greater stability in tariff-making. Surely if there is one thing more than another that business desires and the world needs to-day it is stability. And is it not more than likely that these provisions will lead to greater stability? What could be more disturbing to business than the long drawn out tariff controversy through which we have just passed? For a year and a half Congress has been working on the tariff and business has been held in suspense. Business men most of all should be interested in this new procedure which affords them adequate opportunity at all times to be heard and to have individual rates modified to meet changing conditions without the serious upheaval which always comes with a general tariff revision. When economic conditions require the change of a tariff rate, it is not necessary under this new system to await a general revision of the tariff in order to obtain relief."

Personnel Association to Hold First National Convention

Immigration, psychological tests, motion pictures, pension plans for workers, employment and labor turnover, shop training and the relation of industry to both the engineering and the public school, will be discussed at the first annual convention of the National Personnel Association in a three-day national forum, to be held at the William Penn Hotel, Pittsburgh, Nov. 8, 9 and 10.

"The Immigrant's Point of View," will be the subject of an address by Michael Pupin, professor of electro-mechanics, Columbia University, New York. Magnus W. Alexander, managing director, National Industrial Conference Board, will speak on our immigration policy and its social and economic effects. Training immigrant workers will be treated in an address by George F. Quimby, industrial service secretary, Associated Industries of Massachusetts.

Psychological tests will be discussed by Dr. E. K. Strong, Jr., director of the Bureau of educational research, Carnegie Institute of Technology, Pittsburgh. Motion pictures will be the general topic of a round-table discussion at which the speakers will be H. M. Jefferson, manager of the personnel development department, Federal Reserve Bank of New York, and Rowland Rogers, lecturer at Columbia University and vice-president of the Picture Service Corporation.

Pensions for workers will be outlined by E. S. Ching, supervisor of industrial relations, United States Rubber Co., Dean R. L. Sackett of the Pennsylvania State College, being also among the speakers at the shop session. Developing men for executive positions will be the subject of an address by R. C. Dooley, manager of personnel and training, Standard Oil Co. of N. J.

Speakers at a session on health education will include Dr. R. F. Quimby, service manager, Hood Rubber Co., Dr. E. S. MacSweeney, medical director, New York Telephone Co., and Dr. F. L. Rector, National Industrial Conference Board.

Trade apprenticeship will be the topic of Paul E. Wakefield, director of the Duquesne Works, Carnegie

Steel Co. A session on foremen training will be addressed by D. J. MacDonald of the Ohio State University and H. H. Tukey, supervisor of foremen's conferences, New York Employing Printers' Association.

Other sessions include one on employment and labor turnover and another on industrial and public school relations. The latter session will include addresses by C. S. Coler, manager of the educational department, Westinghouse Electric & Mfg. Co., R. L. Cooley, superintendent of Continuation Schools, Milwaukee, and Dr. Clifford B. Connelley, commissioner of labor, Pennsylvania.

Next Foundrymen's Convention at Cleveland —International Exhibit at Paris

The 1923 convention and exhibition of the American Foundrymen's Association will be held in Cleveland. This decision was reached following a recent meeting of the directors of the association at Chicago, a mail ballot of the directorate being canvassed on Oct. 23. Saturday, April 28, will be opening day for the exhibits and Monday, April 30, will be opening day for the annual convention. The closing day will be Thursday, May 3. It is proposed that Saturday, April 25, be Cleveland day for the inspection of exhibits.

Of special interest is the action taken on an invitation received from the Association Technique de Fonderies of France, asking the American Foundrymen's Association to join with the foundrymen's associations of France, England and Belgium in an exhibit in Paris in the first fortnight of September, 1923. The invitation was accepted and referred to a committee to decide to what extent the association will take an active part in the proposed international meeting. The chairman of the committee is H. Cole Estep, London, England, and Stanley G. Flagg, Jr., Philadelphia, is vice-chairman. The other members are L. L. Anthes, Toronto, Canada; G. H. Clamer, Philadelphia, and A. O. Backert and Franklin G. Smith, Cleveland.

Metal Working and Machinery Leaders Helping Red Cross

The Annual Roll Call of the American Red Cross for registration of the membership for 1923 will begin on Armistice Day, Nov. 11, and close on Thanksgiving Day, Nov. 30. The ground work for this stupendous task of re-enrolling the membership throughout the world has been laid in a plan for the first complete and comprehensive system of registration of the Red Cross membership in all its 3300 active chapters at home and abroad.

In New York a strong committee of men identified with metals and machinery trades is active in behalf of the Red Cross. A. B. Schultze, secretary New Jersey Zinc Co., is chairman of a committee among whose members are: W. L. Lasky, of the American Can Co.; C. V. Day, American Brass & Copper Co.; E. F. Caldwell, 36 West Fifteenth Street; A. W. Dodd, American Zinc, Lead & Smelting Co.; A. H. Sloane, Copper and Brass Research Bureau and M. W. Ferguson, Hayden, Stone & Co.

P. W. Brotherhood, of Manning, Maxwell & Moore, and W. W. Nichols, of the Allis-Chalmers Co., with Marshall Prentiss, of Prentiss & Co., will get the Red Cross appeal before executives and employees in boiler, engine and machinery groups, while F. C. Sauer, of the Symington Co., will handle the Roll Call for railroad supply houses. W. Y. Churchill, of the Vandyck Churchill Co., and Mr. Pratt, of Babcock & Wilcox, are active in the engine and machinery group.

Papers announcing the merger of the General Refractories Co., of which Governor Sproul is president, with the Pennsylvania Fire Brick Co. and the Hayes Run Fire Brick Co., with a capital of \$18,000,000 were filed in the Pennsylvania State department recently.

DECREASED DEMAND

Less Activity in Sheets and Some Other Products at Youngstown

YOUNGSTOWN, Oct. 31.—While steel demand is weaker in spots, it is by no means of inconsequential proportions. One of the important Valley makers of steel bars reports it is booked until Jan. 1, 1923. Producers of sheet bars have comfortable unfilled tonnages, though material for fairly prompt delivery is obtainable. Pipe demand, especially in the larger sizes, has picked up appreciably within the past month and inquiry is brisker.

The principal weakness has been in the sheet market, though enough business has come through to enable manufacturers to maintain a high operating rate. One interest reports the receipt during the week of several inquiries, each involving 1000-ton lots, and a number for 400 tons and over. Another maker, temporarily overbalanced on black business, states that buyers in the South are seeking to expedite deliveries of galvanized roofing products.

A recent careful survey of the market by Valley interests revealed a price range on blue annealed sheets of from 2.55c. to 2.75c., with considerable business being placed at 2.65c., as a fair average. Black sheets have settled for the time being to a 3.50c. base, though the stability of this figure is questioned in some quarters. Galvanized is purchasable at 4.50c.

Some of the smaller outlying mills have been quoting from \$2 to \$3 per ton below these figures on attractive tonnages in order to fill gaps in their rolling schedules. It is also reported that one of the larger makers has dipped below these prices to prevent gaps in its rollings.

One of the important Valley interests is keeping a close check on prices in sheet bars and sheets, and has asked its customers to notify it of any quotations below the market. The inference is that it will meet a competitive situation, where such actually exists.

Interest in the trade is likewise focused on prices to apply in the first quarter of 1923. Reports of quotations sent in by customers are being checked.

It is the prediction of one conservative interest that sheet bars will settle to a \$37.50 base in the next quarter, with a possible spread up to the present market of \$40. Youngstown mills have sold substantial tonnages at this figure for delivery over the final quarter of 1922, but a weakness is apparent, due to the decline in pig iron quotations. Sheet mills buying their steel requirements are already indicating that sheet bar prices should be shaded.

Standard basic iron is on a \$30 base in this district, though a number of sales are reported at \$29.50.

Proposed Increase of Rates Approved by Commission

WASHINGTON, Oct. 31.—The Interstate Commerce Commission in a report last week relating to proposed increases in rates on iron and steel products from Ohio and Mississippi River crossings to the Southeast found justified the proposed increases on articles rated as special iron in Southern classification from Ohio River points, St. Louis, and points taking the same rates to points in Carolina territory, Augusta, Ga., south Atlantic ports and points taking the same rates to the extent the increases do not exceed the existing rates to Virginia cities from the same points. The commission said that to the extent the proposed increased rates exceed those to the Virginia destinations and from the same points of origin they have not been justified. The commission pointed out that this revision is not intended to be permanent and that different conclusions may be reached as a result of its present investigation into Southeastern rates, and that its findings should not be understood as requiring a reduction in present rates.

The schedule under suspension were the object of protest by manufacturers and jobbers at Ohio River points and St. Louis. It was stated by the commission

that the particular grievance of the protestants lay in the fact that no increases were proposed from Pittsburgh and Birmingham, where their two chief competitors are located, or from Atlanta.

An order for cancellation of the suspended schedules by Nov. 25 was entered by the commission which authorized the publication by that date on five days' notice of new ones in conformity with its findings.

Sheet Sales Increasing

Sheet statistics for September as compiled by the National Association of Sheet and Tin Plate Manufacturers, for the Bureau of Census, Department of Commerce, disclose a gain in sales of 13,368 tons, as compared with August, and of 45,300 tons as against the July sales. Production last month was 25,798 tons less than in August, but 23,500 tons greater than in July. Shipments in September were 25,173 tons less than in the previous month, but exceeded those of July by 8646 tons. Unfilled orders show a decline for the third consecutive month, while unshipped orders moved up in September for the third consecutive time. Unsold stocks, which declined in July and August, increased last month.

The figures for September compared with those of the two preceding months as follows:

	September, Net Tons	August, Net Tons	July, Net Tons
Sales	188,863	175,495	143,563
Production	202,600	228,398	179,100
Shipments	190,027	215,200	181,381
Unfilled orders.....	378,574	379,249	409,885
Unshipped orders....	102,198	96,058	82,053
Unsold stocks.....	21,241	19,184	19,586

Employment Gains at Milwaukee

Reports from 48 metal-working shops in Milwaukee, Wis., assembled by the National Metal Trades Association, show a total of 15,352 employed in August and 15,491 in September, an increase of 139 employees. The average number of hours worked per week per man was 51.1 in both months. A comparison of 36 shops for the months of September, 1921 and 1922, showed an increase of 2955 employees in the present year or 22.1 per cent. September, 1922, also showed a gain of 9.4 hours worked per man per week. The total number of man hours for these shops in that month was 2,755,262, as against 4,212,392 in March, 1920, when the high point in production was reached.

Automobile and Truck Production

Figures of the Department of Commerce place the September production of automobiles at 186,562 cars and 18,843 trucks, this being the sixth successive month showing a total production of more than 200,000 cars per month. Figures for the year to date, month by month, are given in the table:

1922	Passenger Cars	Trucks	Total
January	81,693	9,416	91,109
February	109,171	13,195	122,366
March	152,959	19,761	172,720
April	197,216	22,342	219,558
May	232,431	23,788	256,219
June	263,027	25,984	289,011
July	224,057	21,357	245,414
August	249,225	24,200	273,425
September	186,562	18,843	205,405
Nine months	1,696,341	178,886	1,875,227

The Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., has leased for 20 years a 5-story building in the Minneapolis industrial district, which will be utilized as a combined sales, service and warehouse center to serve the territory known as the Twin City area. The building is one of a group erected by the Northwestern Terminal Co., Minneapolis. Norman Stewart is manager of the Minneapolis office, and J. D. Whitaker is service superintendent. The Westinghouse Lamp Co. also will be located in the new building, with H. C. Auren in charge of its interests in the Minneapolis district.

EIGHTY YEARS IN BUSINESS

Joseph T. Ryerson & Son Celebrating Establishment of Firm in 1842

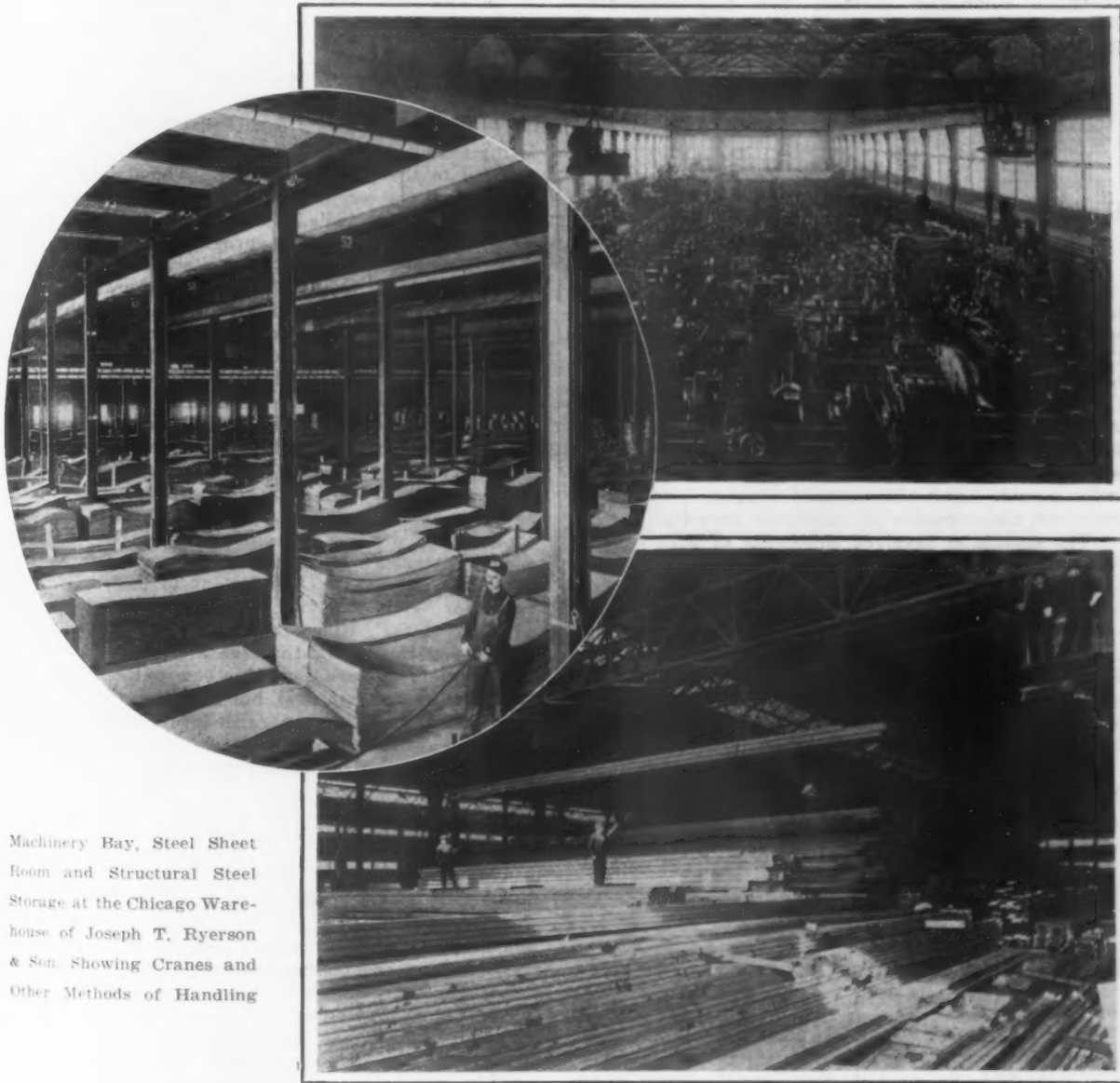
Shortly after the Duke of York ousted the Dutch magistrate and granted Jersey to Lord Berkeley, George Ryerson and a syndicate purchased 6000 acres of land in the northern part of the colony. In 1695 he began to develop this tract for agricultural purposes, later discovering and developing iron ore beds.

In the next generation Marten Ryerson, a son, fur-

wood to Capt. Thomas Machin and John Nicoll for clips, links and bolts furnished to the Government. The bill amounts to £5,000 English and is dated 1777.

Part of the chain which was stretched across the Hudson at West Point to prevent the British from coming up the river was forged at Ringwood, the other part being made at the Sterling Iron Works nearby. A piece of this chain is now among the exhibits of the Chicago Historical Society.

About 1790 Marten's son Thomas started business in Philadelphia as a wholesale dealer in finished iron and steel products. Joseph, the son of Thomas, continued the business until 1842, when he removed to



Machinery Bay, Steel Sheet Room and Structural Steel Storage at the Chicago Warehouse of Joseph T. Ryerson & Son, Showing Cranes and Other Methods of Handling

ther developed iron production, and quite an amount of pig iron was made as early as 1740. The colonists were using much iron and were coming to depend upon home industry to a greater extent. This was the period of the French and Indian wars and arms and ammunition were needed. About 8000 tons of ore were taken out of the Iron Hill mine, one of the group operated at this time.

The old furnace at Wynokie is still standing and in exceptionally good condition, still bearing the Ryerson inscription. The ore was melted in it by placing alternate layers of coal or charcoal and of ore until the outfit was full. The fire was then started and kept going by means of a forced draft from immense bellows operated by a small waterfall.

Later the Ringwood and Wynokie mines played an important part in the Revolutionary War, supplying the Colonial army with great quantities of munitions material and equipment. Hanging framed at Washington's headquarters at Newburgh is a bill from Ring-

Chicago, arriving there Nov. 1, just 80 years ago, where he found a town of some 6000 people.

With the receipt of a stock of iron from the East, the store was opened for business. This was the beginning of the present firm of Joseph T. Ryerson & Son. Chicago was then, perhaps even more than now, the gateway of the West. The gold rush of '49 brought many newcomers. The population steadily increased and the steel business flourished. In ten years Mr. Ryerson moved three times, each time into larger quarters. The business grew and prospered until Oct. 9, 1871, when the Chicago fire reduced the building to ashes and the stock to a conglomerate heap of molten metal. The burned store was rebuilt during the winter.

Joseph T. Ryerson died March 9, 1883, and his son, Edward L. Ryerson, succeeded him at the head of the business. To facilitate the administration of the rapidly growing concern, the firm was incorporated in 1888. The business weathered successive panic periods

and grew to such an extent that in January, 1892, it was necessary to add two stories to the three-story building erected ten years earlier. Additional property was purchased later and a five-story addition erected on each side of the main building. In 1908, to get still more room, property was purchased farther from the center of the city and nearer the heart of the industrial district. Here were erected the first buildings of the present Chicago plant, which now occupies a ground area of over 19 acres.

When Edward L. Ryerson retired from the presidency in 1912 and became chairman of the board of directors, Clyde M. Carr, for many years active in sales and administrative work, became president. The executive committee includes five vice-presidents—Joseph T. Ryerson, Donald M. Ryerson, Edward L. Ryerson, Jr., George Moody and E. L. Hartig.

WHAT ARE WIRE RODS?

Decision as to Freight Rate Involves Definition of Steel Products

WASHINGTON, Oct. 31.—Involving terms descriptive of steel products, the Interstate Commerce Commission in a decision handed down last Saturday in connection with the complaint of the Lancaster Steel Products Co., Lancaster, Pa., against the Director General, et al., held that fifth class carload rates on wire rods from Canton and Youngstown, Ohio, and the Pittsburgh district to Lancaster and on steel wire and band steel from Lancaster to Harrison, N. J., and eastern destinations were inapplicable and unreasonable and reparation was ordered paid. Applicable commodity rates, it was found, were not unreasonable or otherwise unlawful.

The complaint involved shipments of wire rods, in coils, since Dec. 1, 1916, from Canton and Youngstown and the Pittsburgh district to Lancaster of wire, in coils, between Jan. 1 and Dec. 31, 1919, and from Lancaster to Harrison; and of band steel, in coils and bundles, during the last four months of 1919 and since July 15, 1920, from Lancaster to points in New England, New York and New Jersey. Shipments which moved prior to Dec. 16, 1916, were barred by limitation and were not considered in the decision.

It was contended by the complainant that its inbound material comes within the tariff description re-

In 1914 the company purchased the plant of the W. G. Hagar Iron Co., doubled its capacity and began to serve the great southwest territory direct from St. Louis. In 1915 the New York plant was built, making the third link in the chain. In 1917, when war was declared with Germany, the Detroit plant, just completed, was offered to the Government. As the War Department did not need it then, a large stock of steel was laid in and the plant began to serve its territory. The warehouse of the Ferguson Steel & Iron Co. at Buffalo was purchased in 1919. This has been enlarged by the addition of a modern sheet and bolt warehouse. The five plants now cover 40 acres and have a combined floor space of nearly 1,500,000 sq. ft.

In THE IRON AGE of Oct. 25, 1917, page 983, is reported the celebration of the 75th anniversary of this firm.

lating to bolt, nail, rivet and wire rods in coils and was entitled to the commodity rate. The defendants contended that the complainant's material is not wire rods but "bar steel in coils," for which no commodity rate or special classification is provided. The commission said the evidence was that the material was "wire rods" and is so known to the steel trade generally and that commodity rates were and are applicable.

Evidence also supported the contention of the complainant, the decision said, that its shipments of steel wire from Lancaster to Harrison came within the steel wire classification taking commodity rates. On band steel Lancaster commodity rates were published and were applied except for the last four months of 1919 and since July 15, 1920, during which former period the railroads applied fifth class rates, contending the article was "not otherwise specified." Upon the discontinuance of that classification on Dec. 31, 1919, commodity rates were again applied until July 15, 1920, when the carriers by supplement to their tariffs provided for "strip steel not otherwise indexed by name, c.l., fifth class." Since then class rates have been exacted upon the theory that the article was strip steel. The carriers claimed that this commodity is not band steel, the commission said, but give no sufficient reason why it should not be so regarded. It declared that the shipments were and are entitled to the application of the commodity rates contemporaneously maintained on band steel.

SHADING BRICK PRICES

Buyers Object to Paying Advance on Magnesite Grade Attributed to Tariff

PITTSBURGH, Oct. 30.—Aside from the fact that there is some shading of the quotation on magnesite brick, it is impossible to chronicle any special change in refractory prices. With the passage of Fordney tariff, carrying a duty of \$11.50 per net ton on dead-burned imported magnesite, the price of that material was increased by that amount and magnesite brick, which prior to Sept. 21, were priced at \$60, immediately were marked up to \$75. Buyers have objected to paying the advance and lately some sales have been made as low as \$70. Some steel makers who hitherto have bought magnesite brick for open-hearth use, have been substituting chrome brick, which, though heavier than magnesite and consequently carrying a higher per brick freight charge, are relatively cheap. It is figured that with chrome brick at \$50 per net ton, magnesite brick should sell at not more than \$65, if the lighter weight of the latter is to be a successful sales argument in competition with chrome brick.

It is said that observance of quotations on fire clay and silica brick is more general than it was recently. But there is still much uncertainty that present prices can be maintained. The Steel Corporation subsidiaries are understood to have placed orders for their require-

ments over the present quarter and to be specifying steadily against these orders. Independent steel companies, however, are merely buying close to actual needs and are protesting strongly against paying the prices demanded. Makers, however, claim that present costs prohibit any price reductions right now. Plant operations no longer are suffering much from railroad transportation conditions. Shipping conditions notably are better with Kentucky and Illinois producers.

We quote per 1000 f.o.b. works:

Fire Clay	High Duty	Moderate Duty
Pennsylvania	\$43.00 to \$46.00	\$39.00 to \$42.00
Ohio	43.00 to 46.00	39.00 to 42.00
Kentucky	43.00 to 46.00	38.00 to 42.00
Illinois	43.00 to 45.00	40.00 to 42.00
Missouri	43.00 to 45.00	38.00 to 42.00
Ground fire clay, per net ton.....		7.50 to 8.50
Silica Brick:		
Pennsylvania		45.00
Chicago		53.00
Birmingham		48.00
Ground silica clay, per net ton.....		9.00 to 10.00
Magnesite Brick:		
Standard size, per net ton (f.o.b. Baltimore and Chester, Pa.)...		70.00 to 75.00
Grain magnesite, per net ton (f.o.b. Baltimore and Chester, Pa.)...		43.50
Chrome Brick:		
Standard size, per net ton.....		50.00

Fire on Oct. 25 destroyed two pattern shops and some of the smaller buildings of the Monessen Foundry & Machine Co., Monessen, Pa.

STEEL AND INDUSTRIAL STOCKS

General Downward Trend with Uncertainty at Close of the Week

Despite a situation in industry the country over which purports to be the best since the spring of 1920, steel and industrial stocks crumpled under violent reactions and joined in the general downward trend. Persistent pressure was exerted against industrial leaders, causing a break to new lows. Although it broke with the rest, Steel common was supported by the optimistic tone of Judge Gary's address. Conflicting opinions were reflected in continued irregularities. At Tuesday's close it was evident, however, that the advance had been halted and that only technical recoveries would follow until some special development intervened. With the mid-week slump Baldwin, American Locomotive, Crucible and Republic broke from two to four points. A spell of uncertainty prevailed in the closing hour, Friday's sharp advance not being regarded as even a hint that the reaction was past. Almost without exception the advice from brokers was to sell industrials and buy railroad stocks, the implication being—whether true or not—that rail stocks are selling far out of line with the former. Industrial prospects, while not brilliant, are reasonably promising.

The range of prices on active iron and industrial stocks from Monday of last week to Monday of this week was as follows:

	Low	High		Low	High
Allis-Chalm.	41½	49	Harbisen Wal. pf. 115	115	115
Allis-Chalm. pf.	96	96	Int. Har.	105½	109
Am. B. S. & Fdry.	75¼	77¾	Int. Har. pf.	118½	118¾
Am. B. S. & F. pf. 111½	111½	111½	Lackawanna Steel.	80½	82¾
American Can.	71½	75½	Lima Loco.	57¾	61¾
American Can pf. 110	111½	111½	Midvale Steel.	32¼	34¾
Am. Car & Fdry.	188½	189	Nat. Acme.	12½	14
Am. Car & F. pf. 122½	124	124	Nat. E. & Sim.	66	68½
Am. Locomotive.	126½	133	N. Y. Air Brake.	35½	38½
Am. Locomotive pf. 121	121½	121½	Otis Steel.	9½	10½
Am. Radiator.	117	120	Pittsburgh Stl. pf.	94	95
Am. Steel Fdries.	42¾	43¾	Pressed Stl. Car.	86	89
Baldwin Loco.	132½	141	Ry. Steel Spring.	117	122
Baldwin Loco. pf. 117	117½	117½	Ry. Stl. Spring pf. 117	117	120
Bethlehem Steel.	70¾	72	Replogle Steel.	28	32½
Beth. Stl. Cl. B.	71¾	74¼	Republic.	48¾	56¼
Beth. Stl. 8% pf. 111½	112	112	Republic pf.	83½	85½
Brier Hill.	16½	17	Sloss.	45½	46¾
Br. Em. Steel.	11	13	Sloss pf.	77	77
Br. Em. S. 2d pf.	31	31½	Steel of Canada.	61½	66½
Cambria Steel.	41	41	Superior Steel.	31	32
Chic. Pneu. Tool.	82	84¾	Un. Alloy Steel.	35½	36¼
Colorado Fuel.	29	31	U. S. Pipe.	28¾	32
Crucible Steel.	77½	85½	U. S. Pipe pf.	69½	70½
Crucible Steel pf.	94¾	94¾	U. S. Steel.	105½	109
Deere pf.	73½	73½	U. S. Steel pf.	121	122½
General Electric.	176	183	Vanadium Steel.	40½	43½
Gt. No. Ore Cert.	33¾	35¾	Va. I. C. & Coke.	58	59½
Gulf States Steel.	84	89½	W'house Air Br.	96	100
Gulf St. Stl. 1st pf. 100	100	100			

Bethlehem Finances

The Bethlehem Steel Corporation has declared the regular quarterly dividends of 1¼ per cent on both classes of common stock, and 1¾ per cent on the new 7 per cent cumulative preferred stock. At the same meeting which was held last Thursday, Alvin Untermeyer, Moses Taylor, H. G. Dalton and Oliver Jennings, the last three of whom represent the Lackawanna interests, were elected directors, succeeding E. V. R. Thayer, J. E. Mathews, J. H. Ward and Allan A. Ryan. President Grace said that although the third quarter earnings were insufficient to cover dividend requirements, they were substantially greater than either of the two previous quarters for the year. Operations are at about 80 per cent, the highest for the year.

Industrial Finances

Utah Steel Corporation, Salt Lake City, which in September, 1921, listed its total assets as \$2,070,898, of which \$1,704,403 was fixed assets and balance cash, accounts receivable and inventories, is in the hands of a receiver.

Net operating income of the Gulf States Steel Co. for the three months ended Sept. 30 are \$340,287, equivalent after taxes, depreciation and preferred dividends to about \$1.90 per share on common stock. This compares with \$1.70 in the preceding quarter and 40 cents per share in the first quarter. This gain obtained notwithstanding wage advances during the last period and the handicap of car shortage part of the time.

The American Can Co. has announced that it will purchase a limited amount of its 5 per cent 15-year debenture bonds maturing in 1928 at 99½ and accrued interest if said bonds are presented at the First National Bank, New York.

A new corporation is to be formed by interests allied with the Iron Products Corporation, and in which that company

will have a large interest. The new corporation proposes to take over a part of the Iron Products Corporation's business, which consists of radiators and self-feeding smoke-consuming stoves and furnaces, thereby relieving the parent company of subsidiary interests, enabling it to devote its entire time to pig iron and pipe.

The consolidated report of the American Smelting & Refining Co. and the American Smelters Securities Co. for the six months period ended June 30, shows that net earnings of operating properties increased \$3,675,776 over the same period in 1921. Total net income increased \$3,524,918, and the income account on June 30 showed a surplus of \$1,825,923 against a deficit of \$1,101,831 on June 30, 1921. In presenting the report, President Guggenheim predicted increased earnings for the latter half of 1922.

Plans of New Companies

The Major Oil-Tite Piston Ring Co., Asbury Park, N. J., has been incorporated with a capital of \$150,000, and will engage in the manufacture of piston rings and kindred mechanical products. It will also conduct a repair shop. The company is receiving bids from manufacturing companies on piston rings in lots of 10,000. This will take care of immediate needs. It is also in the market for automatic machinery for manufacturing its own product. Plans for a manufacturing location are still undecided, but preference is given to Newark and New York. C. Wesley Major is secretary.

The Protector Non-Skid Chain Co., 1301-03 West Baltimore Street, Baltimore, Md., which was recently organized to manufacture chains, has let contracts for immediate manufacture to the Maryland Metal Products Corporation, Hagerstown, Md., but has plans under way for the equipment of a plant next year. At that time, it will be in the market for equipment used in the manufacture of pressed steel parts. Its chains will be made from a series of rectangular pressed steel links with a four-sided flange which prevents side skid as well as forward and backward. O. M. Peters heads the company.

The Steadylite Motion Picture Corporation, New York, has been incorporated with a capital of \$1,000,000, to manufacture motion picture machines and parts. Plans for manufacture are still in embryo, further developments awaiting the results of experimentation. The incorporators are: J. Bramwell, A. P. Anderson and L. C. Gunn. Davis, Wagner, Heater & Holton, 34 Nassau Street, New York, are the corporate representatives.

The Bunker Mfg. Corporation, 1110-12 Woodland Avenue, Kansas City, Mo., has been incorporated with a capital of \$150,000, to manufacture tire chains. All manufacturing will be done in its own fully equipped plant which is already producing. The directors and officers of the company are: C. A. Bunker, president; C. M. Kryder, vice-president; F. T. Shepard, secretary; L. R. Van Houton, treasurer, and K. E. Kryder, sales manager.

The Blackburn Steel Co., Jersey Avenue and Central Railroad of New Jersey, Jersey City, N. J., has filed notice of organization to operate a structural steel and iron works. A plant has been leased and fabricating work is being done to the extent of about 800 tons per month. It specializes in derricks. Richard H. Blackburn, 92 Oak Street, Jersey City, heads the company.

The Prudential Automobile Service Corporation, Fifty-seventh Street and Broadway, New York, has been incorporated with a capital of \$100,000, to manufacture automobile parts and operate a general machine repair works. Its manufacturing for the present is being done by contract. The incorporators are: H. E. Rampton and L. Billig.

The Harvey Mfg. Corporation, New York, has been incorporated with a capital of \$20,000, to manufacture metal products. The company is still in the process of organization. Morris Friedberg, 116 Nassau Street, New York, is corporate representative.

The Electric Cord Adjuster Corporation, 103 East 125th Street, New York, which was recently incorporated to manufacture electrical equipment, is in the market for black steel spring wire and tubing. A. F. Brown is manager.

The Apex Tool & Stamping Corporation, 4830 Southern Parkway, Louisville, Ky., was recently organized to manufacture tools, stamped metal goods, etc. Some equipment has been purchased and the company expects to be in full operation within a month. It has pending several contracts for stampings, which together with tool and die manufacturing will constitute the activities of the company. Address, Lee F. Hukill, secretary-treasurer, 611 South Fortieth Street, Louisville.

The Triplex Mfg. Co., 62 Highland Avenue, Somerville, Mass., has filed notice of organization to manufacture mash. At present it is considering bids on its manufacturing which will be done by contract until spring, when it will look for

a factory equipped for this line of work. At that time such equipment will be added as is required for the special processes involved. At the present time the company is in the market for corrosion-resisting metal strips and glass. L. O. Card is president; M. F. Camera, vice-president; W. I. Harrison, treasurer, and A. W. Sweetman, secretary.

The Keifer Electrical Supply Co., Peoria, Ill., has been incorporated with a capital of \$30,000, to manufacture electrical equipment and supplies, but does not purpose to do any manufacturing, at least for the time being. It will act as distributor.

The Meriden Novelty Co., Meriden, Conn., has been incorporated with a capital of \$25,000 to manufacture metal specialties. At present it is renting factory space in that city. Address, F. E. Bemis, 74 Wilcox Avenue, Meriden.

The Titeflex Metal Hose Co., Badger Avenue and Runyon Street, Newark, N. J., has been incorporated with a capitalization of 5,000 shares of no-par stock, to manufacture metal reinforced hose. This company succeeds to the Titeflex Metal Hose Corporation, a New York company, having almost the same personnel. It will manufacture all-metal hose, and full and semi-interlocked tubing. C. W. Fletcher heads the company, and he with W. K. Herbst and R. H. Stone are the incorporators.

The Burdick-Atkinson Corporation, 33 Scott Street, Hamburg, N. Y., which was recently incorporated, will engage in the manufacture of steel wire springs. John S. Burdick, formerly vice-president and general manager of the Buffalo Body Corporation, is president; Frederic R. Atkinson, vice-president and works manager; F. R. Brown, treasurer, and H. Burdick, secretary.

The Gasoscope Co. of America, St. Louis, has been incorporated with a capital of \$500,000, to manufacture gas measuring devices and other mechanical equipment. It has a fully equipped plant and is already producing. Address, John E. Bishop, care of the Corporation Trust Co. of America, DuPont Building, Wilmington, Del.

The Swinall Mfg. Co., 508 South Dearborn Street, Chicago, was recently incorporated with a capital of \$25,000 and will manufacture its own products, chief of which are safety devices. It is in the market for machinery. William Kennedy is sales manager.

The Wichita Fender Brace Co., Wichita Falls, Tex., was recently incorporated with a capital of \$10,000 and will manufacture braces and sheet metal specialties. The company has constructed a building and installed necessary equipment for present operations. J. C. Mytinger is president.

Trade Changes

The Western Iron Stores Co., Milwaukee, Wis., has been appointed sole representative in Wisconsin for the Barber-Colman Co., Rockford, Ill., manufacturer of gear hobbing machines, milling and gear cutters, and hob grinding machines. The company has also been appointed Wisconsin distributor for the line of transmission machinery and equipment manufactured by the Dodge Sales & Engineering Co., Mishawaka, Ind. The quarters of the Western Iron Stores Co. are being remodeled and the work will be completed on Nov. 25, when a formal opening will be held and a complete line of mill supplies, mechanics' tools, metal and woodworking machines will be displayed.

John W. Gamble, president Standard Chemical Mfg. Co., and vice-president First National Bank, Omaha, Neb., has purchased the American Machinery & Supply Co., Omaha, of which he will be president and treasurer. Thomas McSchane will be vice-president and general manager and Benjamin J. Harrison secretary.

The Peerless sheet metal Works, Inc., 637 First Avenue, New York, has been incorporated with a capital of \$15,000, to manufacture sheet metal and other metal products. It is still in the process of organization. The incorporators are: I. L. Gaffin and M. Heyert.

The Bertelsen & Petersen Engineering Co., East Boston, ship and stationary repairs, discontinued business under this name Nov. 1. Officials and a large percentage of the working forces have become associated with the Atlantic Works Corporation, which has purchased a part of the former company's real estate, floating dry dock and other equipment. With these added facilities, the Atlantic Works Corporation can repair vessels up to and including 10,000 tons. Under the combination Fred McQuesten is president; Jens Bertelsen, vice-president; Alfred E. Cox, treasurer and general manager; Edward P. Robinson, agent; Paul J. Bertelsen, works manager; Joseph M. Robinson, purchasing agent; George S. Webster, superintendent; Ralph C. Christensen, outside superintendent, and Carl G. Hedblom, assistant superintendent.

Columbia Steel & Shafting Co., Pittsburgh, announces that Edgar T. Ward Sons Co. has been made its exclusive distributing agents in those centers where the Ward company

maintains warehouses. These are located in Boston, Newark, N. J., Brooklyn, Philadelphia and Chicago. The Columbia Steel & Shafting Co. maintains its own warehouses in Detroit and Cleveland.

C. S. Norris and A. J. Lewis have organized the Esther Coal Co., with offices at 416 State Building, Pittsburgh. The company will do a brokerage and agency business in coal and coke.

The Valley Foundry & Machine Works, Inc., 710-32 H Street, Fresno, Cal., announces that W. R. Marvin has succeeded L. E. Woodsend as general manager.

The C. F. Bulotti Machinery Co., 67 Main Street, San Francisco, has been appointed agent in California territory for the Whiting Corporation, cranes, foundry equipment and railroad specialties, Harvey, Ill., to succeed the Eccles & Smith Co., San Francisco.

Such executive and administrative offices of the Youngstown Steel Co. as are directly connected with the erection of the new mechanical puddling plant at Warren, Ohio, will be removed to the plant offices at North Mahoning Avenue, Warren, the address of which is R. F. D. 3, Warren, Ohio, effective Nov. 1. Those of the personnel who will remove to Warren at this time are T. M. Phillips, H. Z. Bixler, E. S. Harrar, L. J. Wilson, W. E. Schmidt and J. P. Suter.

The Alvord Reamer & Tool Co., Millersburg, Pa., announces the appointment of C. C. Strout in the capacity of vice-president in charge of sales. He was formerly connected with the Victor Saw Works as western sales manager, and with the Safety Wrench & Appliance Co. as general sales manager. This company has formed a service department in connection with its engineering division to function in supplying consulting service in connection with special tool equipment. A. M. Lindsley will have charge of the new department.

The Morris Tool Co., Inc., 808 Lincoln Place, Brooklyn, tools and tool holders, has removed its offices to 30 Church Street, New York.

The Ohio Electric & Controller Co., 5900 Maurice Avenue, Cleveland, announces the opening of a district sales office at 53 West Jackson Boulevard, Chicago.

The Arion Steel Co., after Oct. 26, will have its offices and warehouse located at 123 Oliver Street, Boston, carrying a complete line of steel.

The Precision & Thread Grinder Mfg. Co., 1 South Twenty-first Street, Philadelphia, recently acquired by A. T. Doud, announces the appointment of William H. Frick as chief engineer in charge of development and service departments. Mr. Frick, who is a grinder expert, was previously connected with Budd Wheel Co. as equipment engineer, with the Landis Tool Co. as master mechanic, and in a similar capacity with the Cleveland Automatic Co., Gisholt Machine Co., Diehl Mfg. Co., and the Hero Mfg. Co. D. F. Bruce (formerly with the Remington Arms Co. and J. E. Lonergan), was appointed superintendent in charge of production. He was formerly superintendent with McCambridge Co. The Precision & Thread Grinder Co. is preparing field and construction service, including time and production records, on precision and thread grinding.

New Trade Publications

Steel Lockers.—Richard W. Jefferis Co., Camden, N. J. Folder No. 330 describes and illustrates in color pressed steel lockers, single and in sets, including specifications.

Wood Preservation.—Century Wood Preserving Co., Century Building, Pittsburgh. Catalog No. 24, 24 pages, 12 x 10 in., outlining various processes used to combat deterioration of ties and timbers. Special sections show the action of destructive agents, prescribing treatment and explaining control and measurement of preservatives. Cubical contents of round poles and contents of crossties appear in tabular form.

Service and Its Value in Dollars and Sense.—Combustion Engineering Corporation, 43 Broad Street, New York. This is a little 16-page pamphlet from the standpoint of the stoker manufacturer, in which business ethics with regard to the sale and installation of stokers receive careful attention. An attempt is made to work out a satisfactory method for providing a definite amount of service to the purchaser with a minimum number of visits.

The Cox Stoker.—Combustion Engineering Corporation, 43 Broad Street, New York. A 24-page pamphlet, 8½ by 11 in., dealing with a chain grate stoker designed particularly for operating on Western and mid-Western bituminous coals. A number of test reports with corresponding curves are included. The pamphlet shows several installation views as well as sketches indicating application of the stoker to various types of water-tube boilers.

Machinery Markets and News of the Works

BUYING IMPROVING SLOWLY

Volume of Machine-Tool Business Still Somewhat Disappointing

Western Railroads Place Fairly Large Orders and More Are to Come Soon

Machine-tool trade is still disappointing as to volume, but each week brings some encouraging signs. Railroad purchases are still to the fore, but business in some other lines, notably companies in or affiliated with the automobile industry, shows promise.

The Chicago, Burlington & Quincy Railroad has bought the shapers, engine lathes, bending rolls and punches and shears on its general list, and will probably place further orders soon. The Chicago, Rock Island & Pacific has added several upright drills and portable lathes to its recent purchases and the Missouri-Kansas-Texas Railway has bought quite heavily at St. Louis. It is expected that the Pennsylvania Lines East will close this week at Philadelphia on the 80 tools

recently inquired for. A supplemental inquiry covers a number of bushing and wheel presses. The orders of the Missouri-Kansas-Texas totaled several hundred thousand dollars, one company's orders amounting to close to \$200,000. The Southern Railway is inquiring for four tools.

In the East railroad buying is scattered and not large in volume. The New York Central has bought a car wheel lathe and the Grand Trunk a 6-ft. radial drill. At Pittsburgh a large volume of business is pending, particularly in cranes, it being estimated that prospective orders total about \$1,000,000. In addition to the inquiry of the National Tube Co. for 41 cranes, about 25 others are being figured on.

Among industrial companies, purchasers of machine-tool equipment include the Cincinnati Hy-Speed Machine Co., Cincinnati, which has bought six machines, and the Republic Brass Co., Cleveland, which has ordered five screw machines. The Helsey Wheel Co., Detroit, is a prospect for machine tools for manufacturing motors for the Gray automobile. The Neely Nut & Bolt Co., Pittsburgh, has inquired for eight tools.

Some further price advances are noted this week.

New York

NEW YORK, Oct. 30.

EXCEPT for a few purchases by railroads, the past week has brought no marked activity in the local machine-tool market. The New York Central has bought a car wheel lathe and a New York company has sold a 6-ft. radial drill to the Grand Trunk and a 250-lb. steam hammer to the St. Louis, Rocky Mountain & Pacific. A large number of machine tools, mostly of the smaller types, will be thrown on the market shortly, an auction sale of the entire stock of the former Wright-Martin aircraft plant at Long Island City having been ordered for Nov. 14. Included in the equipment are considerable numbers of turret screw machines, drilling machines, lathes, etc.

Quietness continues in the crane market, although there are a fair number of inquiries current for both locomotive and electric overhead cranes. The hand-power crane market is dull. Prices on both overhead and locomotive cranes exhibit an advancing tendency. Some manufacturers of chain blocks and hand-power cranes have made slight percentages of increase and one locomotive crane builder is said to be on the point of increasing quotations. A pending order, which is expected to be closed this week is from the Hummell-Ross Fibre Corporation, which has been receiving bids on a 5-ton, single I beam hand-power crane and a 10-ton, 39-ft. 6-in. span hand-power crane through J. H. Wallace & Co., 5 Beekman Street, New York, consulting engineers. The Armstrong Cork Co., Lancaster, Pa., which is building an addition to its plant has recently purchased cranes. The inquiry of Sanderson & Porter, New York, for a 100-ton overhead traveling crane may be closed this week.

Among recent purchases are:

Phoenix Utility Co., 71 Broadway, New York, a 60-ton, 4-motor, overhead traveling crane from the Whiting Corporation.

Lockjoint Pipe Co., Ampere, N. J., four 25-ton and two

10-ton locomotive cranes for handling buckets from the American Hoist & Derrick Co.

West Virginia Pulp & Paper Co., 200 Fifth Avenue, New York, a 20-ton, 50-ft. boom locomotive crane for use at its Piedmont, W. Va., plant, from the Industrial Works.

Brooklyn Foundry Co., Boulevard and Orchard Streets, Astoria, L. I., a 2-ton, 22-ft. span, 3-motor overhead traveling crane from the Columbia Hoist & Machine Co.

Mackintosh-Hemphill Co., Pittsburgh, a 50-ton, 60-ft. span crane with 10-ton auxiliary and a 5-ton, 30-ft. span overhead traveling crane from the Niles-Bement-Pond Co.

The Curran Motor Car Co., 61 State Street, Albany, N. Y., will soon take bids for a one-story assembling plant, 60 x 100 ft., in the North Albany section, estimated to cost \$50,000. A. L. Delahanty, 17 Steuben Street, is architect.

The New York Telephone Co., 15 Dey Street, New York, has filed plans for a two-story service building and machine repair shop, 155 x 202 ft., at White Plains Avenue and Penfield Street, for company automobiles and trucks, to cost \$200,000, including equipment. McKenzie, Voorhies & Gmelin, 342 Madison Avenue, are architects.

Officials of the W. N. Best Co., 11 Broadway, New York, have organized the W. N. Best Engineering Corporation under Delaware laws, with capital of \$100,000, to manufacture oil burning equipment, tar burners and kindred apparatus. The company is headed by A. H. Best, Carl E. Zihold and Charles A. Beach.

The Cantor Corporation, care of Frank S. Parker, 44 Court Street, Brooklyn, consulting engineer, will build a two-story garage and machine shop, 150 x 200 ft., at Park Avenue and 164th Street, to cost about \$150,000.

The Estate of S. Weinstein, 100 Richardson Street, Brooklyn, manufacturer of doors, sash, etc., has purchased property at Meserole Avenue and Calyer Street, Greenpoint section, for \$70,000, as a site for a new plant, including machine shop and power house, estimated to cost approximately \$500,000. Machinery for the most part will be electrically operated. It is purposed to have the plant ready for service early in the spring.

The Fulton Metal Co., 296-8 Fourth Avenue, Brooklyn, is taking bids for a one-story addition at Fourth Avenue and First Street, 80 x 90 ft., to cost \$17,000.

The Silver Mfg. Co., 90 West Street, New York, manufacturer of machine tools, wood-working machinery, etc., with plant and headquarters at Salem, Ohio, has disposed of

a bond issue of \$250,000, a portion of the proceeds to be used for extensions and additional working capital. A. O. Silver is treasurer.

The National Railways of Mexico, Government Administration, 233 Broadway, New York, are planning for the electrification of the Tampico-San Luis Potosi Division, about 275 miles, to include power plants, electric shops and other mechanical and electrical structures. G. L. Trevino, Monterey, Mex., is electrical engineer in charge.

The Studebaker Corporation of America, South Bend, Ind., will make improvements at its New York headquarters and parts department, Broadway and West Seventieth Street, to cost about \$40,000.

The Bliss Waterproof Concrete Block Co., 34 Union Hall Street, Jamaica, L. I., has plans for a new one-story factory, 100 x 200 ft., at Carroll and Foley Streets, to cost about \$50,000.

The Pan-American Petroleum & Transport Co., 120 Broadway, New York, has plans in progress for a new oil refinery at Los Angeles Harbor, near Wilmington, estimated to cost \$500,000 with machinery. Plans are being perfected for taking over the Mexican Petroleum Co., same address, a subsidiary, and merging with the parent organization. Edward L. Doheny is head of both companies.

Weinberg Brothers, 167 Central Avenue, Albany, N. Y., have had plans prepared for a one-story machine and repair shop at 152 Sherman Street, and will soon break ground. Peter J. Pagano, 61 Maiden Lane, Albany, is architect.

Officials of the Iron Products Corporation, 41 East Forty-second Street, New York, are forming a subsidiary organization for the manufacture of radiators, stoves and furnaces. Extensive operations are planned, including plant establishment in different sections. The present branch of the parent organization devoted to this line of production will be taken over by the new company.

Officials of the Timken Roller Bearing Co., 230 West Fifty-sixth Street, New York, with plant and headquarters at Canton, Ohio, have organized the Timken Roller Bearing Service & Sales Co., to establish and operate repair and service plants in various cities. H. H. Timken is head.

The American Smelting & Refining Co., 120 Broadway, New York, is perfecting arrangements for a bond issue of about \$5,000,000, a portion of the proceeds to be used for extensions and improvements, including additional machinery installation, at its plants in Colorado and Mexico.

The Eastern Tool & Mfg. Co., Bloomfield Avenue, Bloomfield, N. J., has taken bids for a two-story addition, estimated to cost \$45,000.

Motors, controllers, mechanical conveyors and other equipment will be installed in the printing plant to be erected by the Paterson Industrial Development Co., 5 Colt Street, Paterson, N. J., to cost about \$400,000. Walter Kidde & Co., 140 Cedar Street, New York, are engineers.

S. Kukielski, 431 Montgomery Street, Jersey City, N. J., manufacturer of wagon parts, automobile bodies, etc., has had plans prepared for a new two-story works at 415-21 Montgomery Street, to cost \$53,000. C. O'Brien, care of owner, is architect.

The Empire State Ice Co., Weehawken, N. J., is taking bids for a new one and two-story ice-manufacturing plant, 65 x 200 ft.

The Salem Glass Co., Salem, N. J., is planning to rebuild the portion of its works destroyed by fire Oct. 16, with loss of \$200,000, including equipment.

The Davis Automobile Co., South Pearl Street, Bridgeport, N. J., has commissioned Walter Custer, 75 East Commerce Street, architect, to prepare plans for a one and two-story service and machine repair works, 75 x 75 ft. John H. Davis is head.

The J. S. Mundy Hoisting Engine Co., 696 Frelinghuysen Avenue, Newark, has tentative plans for an addition to its main shop, to include the installation of new equipment. Other extensions will also be made to double, approximately, the present production. Work will commence in 1923.

The Public Service Electric Corporation, Public Service Terminal, Newark, will commence the erection of a three-story steel and concrete addition, 142 x 325 ft., to its power plant at Point-No-Point, estimated to cost \$1,000,000.

The Department of Streets and Public Improvements, City Hall, Newark, is receiving bids for a two-story addition to the municipal automobile service and repair works at Franklin Street and Broom Alley, to cost \$175,000.

The William H. Nicolls Co., 2-10 College Place, Brooklyn, is inquiring for a used 96-in. vertical boring mill.

New England

Boston, Oct. 31.

THE machine tool market is more active in spots with the demand for new equipment again featuring business. October, with several local concerns, at least, will prove one of the few months this year where red figures do not appear on books. Going business as a rule is still confined to one, two or three tools, but lists, although small, are developing.

A paper mill has a list of nine tools, against which two will be bought now and the remainder later. A Massachusetts machinery builder is about to close on a round number, possibly a dozen milling machines, and three or four lists calling for various sized presses have made their appearance. Some lists out, however, do not hold much promise. For instance, a Connecticut shipyard is asking for prices on several large machines, but in this case the inquiry is believed to be for inventory purposes. A New Britain inquiry for 200 polishing stands and attachments holds little promise.

Sales the past week include six presses to a Rhode Island concern; a \$2,600 milling machine to a Connecticut interest; two 24-in. shapers to a Springfield, Mass., district manufacturer, and a miscellaneous lot of upright drills, grinders, saws, shapers and lathes, in addition to used planers, lathes, pressers and shapers to textile and other machinery makers, etc. The Atlas Tack Co., Fairhaven, Mass., recently bought tack making equipment for its proposed new St. Louis plant. There is a possibility of much of the company's Cleveland plant equipment being moved to St. Louis, and the Cleveland plant given up. Small fine tools, machine tool parts, files, hacksaws, drills and reamers are moving in larger volume.

Nut and bolt machinery makers, effective Nov. 1, advanced prices approximately 10 per cent. Cranes are on the point of advancing; builders have notified prospective customers that outstanding quotations hold only for a limited period. Although nothing official has been given out, it is indicated an advance in prices for all sizes and kinds of motors will be put into effect in the near future. Leading makers of leather belting have gone up approximately 10 per cent on list quotations. Manufacturers of saws have advanced prices 10 per cent on everything but hacksaws.

Bids were taken last week on a two-story 50 x 170 ft. manufacturing unit at Providence, R. I., contemplated by the Crompton & Knowles Loom Works, 93 Grand Street, Worcester, Mass.

The Brooks Skinner Co., Inc., Quincy, Mass., portable garages, has awarded contract for a one-story, 100 x 242 ft. plant, to cost about \$50,000.

Fletcher-Thompson, Inc., 1089 Broad Street, Bridgeport, Conn., are the architects for a two-story, \$250,000 manufacturing plant to be erected by the Thompson Machine Co., Belleville, N. J., contract for which has been let.

The New Haven Malleable Iron Co., New Haven, Conn., has bought about five acres of land on Middletown Avenue, adjoining its plant, for future expansion.

George M. Thompson, West Newton, Mass., formerly vice-president and general manager Wickwire-Spencer Steel Corporation, Worcester, Mass., is equipping a small steel rolling mill on Mildred Avenue, Dorchester, Boston, consisting of a one-story, 60 x 115 ft. building and two one-story storage units, 25 x 35 ft., and 50 x 150 ft. Brainerd, Leeds & Kellogg, Boston, are the architects.

The Tileston & Hollingsworth Co., 892 River Street, Hyde Park, Mass., manufacturer of paper products, has awarded contract to the Aberthaw Construction Co., 27 School Street, for a one-story addition to its machine department to cost \$30,000. George F. Hardy, 309 Broadway, New York, is engineer.

The Suburban Gas & Electric Co., Winthrop, Mass., is arranging for a stock issue of \$417,000, a portion of the proceeds to be used for extensions and improvements.

The New Haven Sherardizing Co., Hartford, Conn., manufacturer of iron specialties, mandrels, etc., is concluding nego-

tations with the Chamber of Commerce, Akron, Ohio, for the removal of its plant to that city. An existing building, totaling about 7000 sq. ft. will be taken over.

Dominick Bertoldi, care of George A. Cornet, 10 Central Avenue, Lynn, Mass., architect, has plans in progress for a one-story machine shop, 40 x 130 ft., on Wilson Square, Peabody, Mass.

The Hersey Mfg. Co., 314 West Second Street, Boston, manufacturer of special machinery, will commence the erection of a two-story factory on E Street, to cost approximately \$30,000.

The Vermont Hydro-Electric Corporation, Pittsford, Vt., will make extensions and improvements in its power plant at Cervers Falls, to include the installation of a 1250-kw. generator, water wheel, and auxiliary machinery.

The Parker Wire Goods Co., 18 Grafton Street, Worcester, Mass., is clearing a site at Washington and Lamartine Streets, heretofore occupied by the Star Foundry, for a new one-story plant totaling about 30,000 sq. ft. of floor space. The present works will be removed to the new location. Edward D. Priest is head.

The Seymour Mfg. Co., Seymour, Conn., is in the market for 10 mill trucks, approximate dimensions 27 in. high and 40 in. wide, length 10 to 12 ft.

Philadelphia

PHILADELPHIA, Oct. 30.

HUMPHREYS & CO., Front and Tusculum Streets, Philadelphia, operating a structural iron and steel works, have awarded a contract to E. E. Hollenback, Inc., 1804 Brandywine Street, for a new plant, two-stories, 60 x 118 ft., to cost \$27,000.

The Edward G. Budd Mfg. Co., Hunting Park Avenue and Twenty-fifth Street, Philadelphia, manufacturer of steel automobile bodies, has filed plans for two one-story additions. Other structures will be erected later, for which plans are being prepared by the Ballinger Co., Twelfth and Chestnut Streets, architect and engineer. The company is arranging for an increase in capital from \$8,750,000 to \$14,498,300, a portion of the proceeds to be used for enlargements.

P. Randolph, Poplar and Forty-first Streets, Philadelphia, is asking bids for a two-story, reinforced concrete, 50 x 100 ft., garage and machine shop at Mascher and Wyoming Streets, to cost \$100,000. Neubauer & Supowitz, 929 Chestnut Street, are architects.

A machine and repair shop will be installed on the third floor of the new three-story building to be erected by the United Auto Sales Co., Philadelphia, local representative for the Studebaker automobile, on property adjoining the present structure.

Property of the Nelson Blower & Furnace Co., Boston, acquired by the Marlin-Rockwell Corporation, Philadelphia, to satisfy a claim, including lathes, milling machines, screw machines, grinders, etc., will be sold on Nov. 16, at plant site, 4825 Reno Street, West Philadelphia.

The Eberhard Watch Corporation of America, Trenton, N. J., recently incorporated with a capital of \$300,000, has acquired 100 building lots in the Woodside Park district as a site for a new watch movement and case manufacturing plant. It will consist of eight individual units, with administration building, power house and other mechanical departments, and will cost close to \$200,000. It will give employment to 500 operatives. George F. Eberhard, formerly manager at the local plant of the Ingersoll Watch Co., heads the new organization, which is represented by Marvin L. Spaulding, 147 East State Street.

The Victor Talking Machine Co., Camden, N. J., has tentative plans under consideration for extensions and improvements. The company has arranged for an increase in capital from \$5,500,000 to \$35,500,000, and will use a portion of the proceeds for expansion.

The Blue Mountain Electric Co., Bethel, Pa., has acquired the Yost mill property at Lickdale, Pa. as a site for a new electric generating plant. It will cost in excess of \$125,000.

The Merchant & Evans Co., 2035 Washington Avenue, Philadelphia, manufacturer of metal roofing, and the Globe Automatic Sprinkler Co., same address, associated, have preliminary plans for a new one-story factory on Fountain Avenue, Lancaster, Pa., 75 x 150 ft. Powell Evans is president.

The Lower Milford-Lehigh Power Co., the Dunham-Busks Power Co., both of Easton, Pa., and the Washington-Berks Power Co. and Hereford-Berks Power Co., both of Reading, Pa., affiliated, recently organized, have plans under way for the installation of power plants and systems in their respective districts. The companies are closely associated with the Metropolitan Edison Co., Reading.

The Tamaqua Mfg. Co., East Broad Street, Tamaqua, Pa.,

manufacturer of mining machinery and parts, has plans for enlargements to double, approximately, the present capacity.

The Central Abattoir Co., Chestnut Street, Reading, Pa., will commence the erection of a new three-story packing plant, with refrigerating and cold storage department, estimated to cost \$185,000, including machinery.

W. T. Merrick, Wellsboro, Pa., and associates, are planning for a new power plant at Blossburg, Pa., for local light and power service, estimated to cost \$30,000.

The General Refractories Co., Oliver Building, Pittsburgh, has acquired the plants and businesses of the Hayes Run Fire Brick Co., Orviston, Pa., and the Pennsylvania Fire Brick Co., Beech Creek, Pa. The properties will be consolidated with others lately purchased in this same section and continued in operation. The purchasing company has arranged to operate with a capital of \$18,000,000.

Fire, Oct. 25, destroyed a portion of the plant of the Monessen Foundry & Machine Co., Monessen, Pa., with loss estimated at \$200,000, including equipment.

E. F. James & Sons, Edwardsville, Pa., operating the Le-Grand Drill Works, manufacturers of mechanical equipment, have plans nearing completion for new works.

The Adelphia Mfg. & Plating Co., Orthodox and Belgrade Streets, Philadelphia, is planning for the installation of additional equipment.

Motors, controllers, conveying machinery and other equipment will be installed in the new printing plant of the "Pottsville Daily Republican," Pottsville, Pa., for which property has been purchased. It is estimated to cost \$500,000. J. H. Zerbey heads the company.

A power house, mechanical conveyors and hoppers, and other operating machinery will be installed in the municipal incinerating plant to be erected by the Department of Public Safety, Harrisburg, Pa., estimated to cost \$85,000. S. F. Hassler is commissioner.

The Confederate Home Abattoir Co., Bethlehem, Pa., has acquired a local site for a new packing house, with refrigerating and cold storage plant, estimated to cost \$100,000.

Richard J. Boyer, head of the R. J. Boyer Printing Co., Lebanon, Pa., has organized a new company to build and operate a plant for the manufacture of disk wheels, special rims and other steel automotive products. Machinery will be ordered at once. Mr. Boyer will be president of the company; L. Raymond Reigert, vice-president, and Frank P. Hammar, secretary and treasurer.

Baltimore

BALTIMORE, Oct. 30.

PLANs have been completed by the Baltimore Steel Co., Eastern Avenue and Eden Street, Baltimore, for two one-story additions to cost \$40,000. Plans are also being considered for a new one-story steel fabricating extension, to cost \$50,000, on site recently purchased. Gilbert A. Wehr is president.

The Bureau of Supplies and Accounts, Navy Department, Washington, will receive bids until Nov. 14 for one 150-ton steam hydraulic forging press, with spare parts, for the naval station at Bellevue, D. C., schedule 257; until Nov. 21 for 3750 ft. galvanized steel pipe for Mare Island, San Francisco, schedule 260.

Fire, Oct. 23, destroyed the plant of the Porcelain Enamel & Mfg. Co., O'Donnell and Eighth Streets, Baltimore, manufacturer of porcelain-making machinery, etc., with loss estimated at close to \$400,000, including buildings and equipment. It is planned to rebuild.

The Jamison Cold Storage Door Co., Hagerstown, Md., manufacturer of cold storage and refrigerating equipment, is planning an addition, to include a galvanizing works.

R. E. Piper, 1522 West Broad Street, Richmond, Va., manufacturer of roofing, cornices and other metal products, plans the installation of a new power shearing machine and other equipment.

George W. Taylor & Co., Haddington Building, Norfolk, Va., have plans in progress for extensions and improvements in their ice-manufacturing plant, to cost \$100,000, including equipment. Ophuls & Hill, 112 West Forty-second Street, New York, are engineers.

The Purchasing Agent, Post Office Department, Washington, will receive bids until Nov. 6 for two arbor presses, each of approximately 5 tons pressure, and until Nov. 8 for 3000 No. 14 steel wire belt hooks.

The Rodrain Electro-Metallurgical Co., Salisbury, N. C., is planning for a new three-story reduction plant near Lexington, N. C., to cost about \$500,000, including machinery. A

power house and machine shop will be built. J. L. Mittenhuler is in charge.

The Andrews-Harris Boiler & Machine Co., Petersburg, Va., will install a boring machine and other equipment.

The Reus Brothers Co., 146 West Mount Royal Avenue, Baltimore, manufacturer of piston rings, etc., has awarded contract to the Charles L. Stockhausen Co., Water Street, for a one-story addition, 59 x 83 ft., to cost approximately \$25,000.

The Standard Electric Machinery Co., 7 East Hill Street, Baltimore, machinery dealer, has inquiries out for 7-10 hp. motors and 300-600 kw. turbo-generator sets, with switchboard, surface condenser and auxiliary equipment.

An electrically operated pumping plant will be installed in connection with a new waterworks system at Williamsport, Md., for which bonds for \$100,000 are being arranged. The City Council is in charge.

J. A. Harvey, Kinston, N. C., is arranging for the organization of a company to construct and operate an ice-manufacturing and cold storage plant at Wauchula, Fla., for which tentative plans are under way.

The Richmond, Fredericksburg & Potomac Railroad Co., Richmond, Va., has acquired about 30 acres at Acca as a site for new locomotive and car shops.

The Norfolk & Western Railway Co., Norfolk, Va., will electrify its coal terminal at Lambert's Point, Piers 2 and 3, with 120-ton coal dumpers and other mechanical equipment.

The Wortendyke Mfg. Co., foot of Thirteenth Street, Richmond, Va., manufacturer of paper products, has authorized plans for a new three-story factory, to cost \$200,000, with machinery. Carneal & Johnson, Chamber of Commerce Building, are architects.

R. P. Johnson, Wytheville, Va., machinery dealer, is making inquiries for a 20 hp., oil-operated engine, portable or stationary.

The People's Motor Co., West Tabb Street, Petersburg, Va., will install bench tools in its repair works, also a lathe.

The Chief of Air Service, United States Army, Washington, will take bids until Nov. 6 for 10 motor-driven gasoline pumps, circular 23-54.

The Purchasing Agent, Post Office Department, Washington, will take bids until Nov. 12 for two automatic riveting hammers.

Beckerley & Trusler, 306 Stewart Building, Baltimore, machinery dealers, are making inquiries for two horizontal return tubular boilers, 150 hp.; 26-36 in. band saw and bench joiner.

The Board of Awards, office of the City Register, Baltimore, will receive bids until Nov. 8 for 400 boiler tubes for the Highway Engineer Department.

The Norfolk & Western Railway Co., Norfolk, Va., will build an electrically-operated pumping plant on the Blue-stone River, near Graham, Va.

The Auto Service Co., 1504 West Broad Street, Richmond, Va., plans the installation of a drill press, emery grinder and other equipment at its repair department. W. H. Wyatt is head.

The Lynchburg Foundry Co., Lynchburg, Va., will rebuild the portion of its pattern shops recently destroyed by fire. An official estimate of loss has not been announced.

The Crystal Ice Co., Elizabeth City, N. C., has commissioned Ophuls & Hill, 112 West Forty-second Street, New York, to prepare plans for a one-story addition to its ice-manufacturing plant, with improvements in present building, to cost \$100,000.

Buffalo

BUFFALO, Oct. 30.

THE M. D. Knowlton Co., manufacturer of paper box machinery, plans to erect a 100 x 137 ft. one-story brick and steel addition to its works on Elizabeth Street, Rochester, N. Y.

The Palmyra Pump & Accessories Co., Palmyra, N. Y., recently organized for the establishment of a factory for the manufacture of patented automobile equipment and devices. An affiliated factory at Rochester, N. Y., will be removed here.

The Empire Gas & Electric Co., Auburn, N. Y., has arranged for a bond issue of \$1,100,000, a portion of the proceeds to be used for extensions and improvements in plants and system.

A lathe, combination saw, cutoff saw, band saw, bench tools, electric motors and other equipment will be installed in the two-story wood-working mechanical shop to be erected at 23 Poplar Avenue, Buffalo, by William P. Hoffman.

The Binghamton Foundry & Machine Co., Binghamton, N. Y., recently organized with a capital of \$250,000, will take over and consolidate the plants of the McGill & Holford Mfg. Co., manufacturer of textile machinery, and Shapley & Wells,

118 Washington Street, manufacturer of boilers and machinery, both of the same city. Plans are under way for expansion. F. L. Dennis and R. S. Cooper head the new company.

The Powertown Tire Corporation, 253 East Avenue, Rochester, N. Y., is taking bids for a four-story service building at 217-19 East Avenue, 40 x 60 ft., to cost \$45,000. Hutchinson & Strutz, Cutler Building, are architects.

The Steinmetz Electric Motor Car Corporation, Kate Avenue and the Western Maryland Railway, Baltimore, is considering plans for a new plant at Syracuse, N. Y., to manufacture electrically-operated motor trucks. Dr. Charles P. Steinmetz, chief engineer General Electric Co., Schenectady, N. Y., heads the company. K. E. Turner is assistant general manager.

The Madison Tire & Rubber Co., Buffalo, is arranging for a bond issue of \$750,000, a portion of the proceeds to be used for extensions and improvements.

The C. D. Reynolds Co., Alfred, N. Y., has tentative plans for rebuilding its refrigerating and cold storage plant, destroyed by fire Oct. 25 with loss estimated at \$80,000. Fred Reynolds is head.

Officials of the Northern New York Utilities, Inc., Watertown, N. Y., have organized the Power Corporation of New York, with capital of \$1,000,000 and 300,000 shares of stock, no par value, to operate hydroelectric power plants for industrial service. Water power property of the St. Regis Paper Co. and the Hanna Paper Corporation, St. Regis Falls, N. Y., and vicinity has been acquired, as well as a site on the Racquette River, where a hydroelectric plant of 60,000 hp. is contemplated. John N. Carlisle, president Northern New York Utilities, Inc., will act in the same capacity for the new company.

Pittsburgh

PITTSBURGH, Oct. 30.

THE local machine tool trade is figuring on the greatest amount of business it has had at one time in more than two years. This, rather than the amount being placed, is the encouraging feature of the situation. Among the important prospective business are the 14 heavy tools for the new plant of the National Tube Co., Gary, Ind.; the lists recently put out by the Pennsylvania Railroad for its Juniata and Conway shops and that of the Pittsburgh & Lake Erie Railroad. Another list before the trade is one of eight tools for the Neely Nut & Bolt Co., Pittsburgh, and calls for a lathe, shaper, miller, drill press, grinder, hacksaw, an arbor press and a portable grinder. Single tool inquiries still are numerous. The trade as a whole looks upon much of the prospective business as very likely to close before the end of the year.

In cranes and other heavy equipment the story is the same as that in the lighter lines. The local offices of power equipment manufacturers, while reporting actual business to be slow, state that prospective orders exceeding \$1,000,000 in value are being figured on. Pending crane business also is heavy. Exclusive of the 41 cranes for the new Gary tube mills of the National Tube Co., there are what are regarded as live inquiries for about 25 overhead cranes, at least 10 jib cranes and a number of hoists. Preliminary quotations for estimating purposes are also going out every day. The National Tube Co. is expected to buy its cranes soon. There has been a report that the order had been placed and that an Ohio and a Michigan builder had divided the award. Confirmation, however, is lacking.

A steel maker outside the Pittsburgh district is in the market for three 10-ton mill type cranes. The Koppers Co. has not yet placed the 5-ton and 10-ton air-operated overhead cranes for the by-product plant addition to the Clairton plant of the Carnegie Steel Co., nor for a 10-ton hand-power crane for the by-product plant of the Weirton Steel Co., Weirton, W. Va. A 50-ton power house crane for the Jones & Laughlin Steel Co. still is pending, while the Pennsylvania Railroad, in addition to the tools it has taken bids on for its Conway shops, Freedom, Pa., has inquired for a 10-ton 3-motor overhead crane, a 2-motor hoist and 10 jib cranes for those shops. The Neely Nut & Bolt Co. wants a 5-ton, 60-ft. span crane.

In crane and heavy equipment orders the Mackintosh-

Hempfl Co., Pittsburgh, recently closed for a 50-ton Niles crane with 5-ton auxiliary hoist, for its Garrison plant, this being a duplicate of a crane already at that plant; the DuRoth Steel Car & Truck Co., Osgood, Pa., has bought one 10-ton 3-motor crane, one 5-ton, one-motor crane and one 2-ton, one-motor crane from the Barber Foster Co., Cleveland; the J. E. Moss Iron Works, Wheeling, W. Va., has bought a used 10-ton Northern crane of 57-ft. 2-in. span from stock at the Hog Island shipyard, and Wellman-Seaver-Morgan Co., Cleveland, has taken orders for four oven pushers for the addition to the Clairton by-product plant and one for the by-product plant of the Weirton Steel Co., together with much other oven equipment.

The Standard Underground Cable Co., Westinghouse Building, Pittsburgh, is taking bids for an addition to its plant at Sixteenth and Pike Streets. The W. G. Wilkins Co., Westinghouse Building, is engineer.

The Gulf Oil Corporation, Frick Annex, Pittsburgh, has disposed of a bond issue of \$35,000,000, a portion of the proceeds to be used for extensions and improvements.

The Maniscalco New Power System Co., M. & M. Bank Building, Sharon, Pa., is arranging for the installation of machinery in a local building to manufacture a special type electric motors and parts.

The West Penn Power Co., West Penn Building, Pittsburgh, has plans in progress for a new power house at State Line, Pa., to connect with the system of the Monongahela Power & Railway Co., Riversville, W. Va., lately acquired. Plans are nearing completion for a new 80,000 hp. electric plant at Charleoi, Pa.

The Fairmont & Cleveland Coal Co., Fairmont, W. Va., has issued bonds for \$350,000, a portion of the proceeds to be used for mining plant extensions of the Chesapeake and other properties, including the installation of power and mechanical equipment.

The National Forge & Tool Co., Irvine, Pa., is planning for the installation of a new heavy type drill press and other equipment.

The Greenview Coal Co., Greenview, W. Va., recently organized, will install electrical equipment, hoisting machinery, mine cars, etc., at its local properties. E. G. Watkins is president and general manager in charge.

John S. Scully, Jr., Winchester, Va., will equip an electric light and power plant in connection with a summer resort enterprise at Capon Springs, W. Va.

The Interstate Oxygen Co., Forty-fourth Street, Wheeling, W. Va., has awarded contract to H. L. Searight, Wheeling, for a new one-story plant, 100 x 150 ft., for the manufacture of commercial oxygen, etc., estimated to cost \$55,000.

The Pittsburgh & Lake Erie Railroad Co., South Smithfield Street, Pittsburgh, will install a 10-ton crane, lathes, drill press and other tools at its shops. C. M. Yohe is purchasing agent.

Detroit

DETROIT, Oct. 30.

A MUNICIPAL hydroelectric power plant estimated to cost \$150,000, with machinery, is under consideration by the Common Council, St. Johns, Mich.

A one-story power house, 40 x 75 ft., will be built in connection with the new four-story hospital of the Holland Hospital Association, Holland, Mich., estimated to cost \$250,000. Robinson & Campau, 715 Michigan Trust Building, Grand Rapids, Mich., are architects.

The Consumers' Power Co., Grand Rapids, Mich., has arranged for a bond issue of \$14,000,000, a portion of the proceeds to be used for extensions and improvements. George E. Hardy is vice-president.

Durant Motors, New York, has awarded contract to the H. G. Christman Co., Detroit, for the construction of an additional unit to the building program in Flint, Mich. The new structures are to be utilized to double the production of the Star car, and will be a duplicate of the plant being erected for the manufacture of the Flint Six, having a floor space of 516,000 sq. ft. May 1, 1923, is the date set for completion, and the Durant enterprises in Flint will then employ at least 8000 men.

The American Steam Pump Co., Battle Creek, Mich., will erect a one-story addition, 50 x 60 ft., to cost \$20,000.

The Commonwealth Power, Railway & Light Co. of New York has purchased the White Lake Power Co. at Montague, Mich., and will further develop the facilities of this company.

The H. G. Christman Co., Detroit, has been awarded contract for building a new distributing station for electric current produced by Lansing's new municipal power plant. The cost is given as \$32,000.

The Common Council, North Muskegon, Mich., has rejected bids received for an electrically-operated pumping plant at the waterworks, and will call for new bids. Hoad, Decker, Shoecraft & Drury, 303 South State Street, Ann Arbor, Mich., are engineers.

Lindwall & Lindstrom, Iron River, Mich., operating an automobile machine and repair shop, are planning for the installation of additional equipment, including drill press, bench tools, etc.

The Rickenbacker Motor Co., 4815 Cabot Avenue, Detroit, has preliminary plans in progress for a one-story addition. F. J. Winter, 2331 Dime Bank Building, is architect.

The Whirlwind Vaporizer Corporation, Detroit, has been organized under State laws, to manufacture vaporizers for Ford automobiles. The incorporators are C. W. and W. M. Grover and H. M. Gaffney, 125 Hill Avenue, Detroit.

The International Seal & Lock Co., Hastings, Mich., is in the market for a heating, lighting and power unit.

Chicago

CHICAGO, Oct. 30.

THE Chicago, Burlington & Quincy has bought the shapers, engine lathes, bending rolls and punches and shears on its general list, and is expected to continue to place orders during the current week. The Chicago, Rock Island & Pacific has added to its recent purchases, having ordered several upright drill presses and portable lathes. Word comes from St. Louis that the Missouri-Kansas-Texas has placed orders for the major portion of its large list. The Boyne City, Gaylord & Alpena Railroad has ordered a 24-in. engine lathe for its shop at Boyne City, Mich. Machine tool business from general sources has fallen off materially, but railroad orders will probably bring October total sales up to a figure which compares favorably with the record for any previous month this year.

The Chicago Mill & Lumber Co., Chicago, has ordered a 5-ton electric overhead traveling crane from the Shaw Crane Co.

The Universal Body Corporation, 230 East Ohio Street, Chicago, recently incorporated with \$50,000 capital stock, has leased 24,000 sq. ft. of factory space in a building at Pershing Road and South State Street and will manufacture automobile bodies of the closed type. It is probable that production will be limited to taxicab bodies until early next spring. All of the work will be done in the company's plant and not by contract. Additional metal-working and wood-working machinery, as well as special body equipment, is expected to be purchased within the next three months. The officers are J. L. Geler, president; W. H. Heggem, secretary and H. L. Schroeder, treasurer.

The X-L Refrigerating Co., Inc., 1834 West Fifty-ninth Street, Chicago, is receiving bids on a one-story factory, 125 x 132 ft., at the northwest corner West Fifty-ninth and Aberdeen Streets, to cost \$60,000. A. G. Lund, 453 West Sixty-third Street is architect.

Rawson & Eisenberg, 5 North LaSalle Street, Chicago, will complete plans about Nov. 1, and receive bids on a three-story factory, 100 x 125 ft., with metal window frames and probably a freight elevator, for manufacturing bed springs.

The Badeker Mfg. Co., manufacturer of metal gaskets, 212 North Sheldon Street, Chicago, has let contract for a one-story factory, 50 x 180 ft., at 4612-14 Park Avenue.

A. E. Ficar is having constructed by Holton, Seelye & Co., 140 South Dearborn Street, Chicago, a one and two-story automobile paint shop, 50 x 163 ft., at 2532 Indiana Avenue, to cost \$120,000.

The International Harvester Co., 606 South Michigan Avenue, Chicago, will construct a one-story foundry, 40 x 213 ft., between the south branch of the Chicago River and the Pennsylvania Railroad tracks, to cost \$55,000.

A. Fulton, 7400 South Ada Street, Chicago, has let contract for a two-story brick ice plant, 175 x 175 ft., at 1313-27 West Seventy-fourth Street, to cost \$50,000.

The Casper Iron Foundry, a recently organized company, is constructing a one-story foundry, 30 x 60 ft., on East C Street, near McKinley Street, Casper, Wyo. Among those interested are Dan Ader, an experienced molder, formerly of Chicago, Ray J. Holloran, and R. D. Crane, for seven years a still man at the Standard Oil Co. refinery at Casper. These men have formed a partnership.

The new power plant of the Public Service Co. of Northern

Illinois, now under construction at Waukegan, Ill., will be 280 x 575 ft., and will have a capacity of 25,000 kw.

The Dubuque Electric Co., Dubuque, Iowa, is constructing an addition to its power plant at the foot of Sixth Street, comprising a boiler house addition, 58 x 63 ft., a skip hoist coal handling system and a reinforced concrete stack, 248 ft. high.

The Central Power Co. is breaking ground for a new steam generating station on a 20-acre site just west and north of the new Burlington Bridge, east of Scotts Bluff, Neb. The station will develop 5000 kw., and will cost approximately \$750,000.

The Mayor and City Council, Marshall, Ill., will receive bids on improvements to the light and power plant until Nov. 9. The new facilities will include a new power house, two a. c. generators directed to unflow engines, switchboard, two boilers, piping, chimney, moving and resetting one fire-tube boiler, etc.

Fire recently destroyed the molding room of the York Foundry & Engine Co., York, Neb. It will be repaired at once.

The Mid-City Foundry Corporation, recently incorporated with \$15,000 capital stock, has leased the plant of Henry E. Pridmore, manufacturer of molding machines, at 1901 South Rockwell Street, Chicago. It will be operated as a foundry for the manufacture of medium and heavy grey iron castings. The officers, all of whom are practical foundrymen with years of experience as molders and core makers, are as follows: Carl J. Berg, president; Julius Droska, vice-president; Lennart Dahlberg, treasurer; and Frank Cederwall, secretary.

The Hassinger Gravimeter Corporation, care Bruckner & Ingraham, 616 Reaper Block, Chicago, recently incorporated with \$200,000 capital stock, will manufacture an instrument for the accurate and instantaneous determination of the specific gravities of solids and liquids at any given temperature. It is designed especially for determining the solid content of milk, fat, sugar, proteins, ash; cheese-making properties; the solid content of oils, acids, chemicals, etc., and will be adaptable for use in determining the composition of ice cream, condensed milk, sugar, cement, asphalt, and other solids. The company has not yet begun manufacturing on a commercial scale, but contemplates leasing a plant for this purpose. It expects to have a plant of its own within a year. The officers are Adolph T. Hassinger, president; George Jay Kepp, vice-president; Jesse E. Meyer, secretary-treasurer.

The Ackermite Co. of America, 80 West Washington Street, Chicago, recently incorporated, has been operating a factory in Chicago for the manufacture of bearing metal for some time, and has concluded arrangements for a much larger plant. The equipment for the new factory has been purchased. Officers are Walter H. Eckert, president; A. H. Ackerman, vice-president; Frank G. Jones, secretary.

The Northern Machinery Co., Minneapolis, Minn., is inquiring for a used No. 22 New Britain automatic.

The Patent Scaffolding Co. of Illinois, 506 South Canal Street, Chicago, has purchased just west of Southport Avenue, fronting 275 ft. on Center Street, and partly improved with a one-story building. It will make some additional improvements and will occupy the property.

The Raymith Mfg. Co., manufacturer of electrical switch boxes, 3707 Ogden Avenue, Chicago, has leased a one-story building, 50 x 125 ft., at 1943-45 Carroll Avenue for five years.

The Tyree Auto Radiator Co., 814 West Thirty-third Street, Chicago, has leased the first floor, 100 x 100 ft., of the building at 1500-02 West Fifteenth Street, for a term of years.

The Bassick Mfg. Co., manufacturer of automobile accessories, 2638 North Crawford Avenue, Chicago, is having plans prepared for a one-story mill-constructed factory, 55 x 142 ft., at North Homan Avenue, near the Chicago, Milwaukee & St. Paul right-of-way. The estimated cost is \$30,000.

At a special city election at Fort Morgan, Colo., Oct. 18, it was voted to issue water bonds for \$125,000, to provide a new power plant.

The Lu Mi Nus Signs, Inc., 1400 South Michigan Avenue, Chicago, has purchased a one-story factory on Wentworth Avenue, north of Twenty-eighth Place.

The Victory Ice & Ice Cream Co., South Keeler Avenue and Sixteenth Street, Chicago, is taking bids for a new two-story ice-manufacturing plant, 200 x 200 ft., estimated to cost \$100,000. E. E. McClellan, 7441 Cottage Grove Avenue, is architect.

The Chicago, Rock Island & Pacific Railroad Co., 139 West

Van Buren Street, Chicago, has plans nearing completion for a one-story addition to the machine shop, 36 x 250 ft., at Cedar Rapids, Iowa, to cost \$25,000. A. T. Hawk, company address, is architect.

The Common Council, Shelbyville, Ill., has arranged a bond issue of \$100,000 for a municipal electric power plant, 45 x 100 ft., and system, with installation to include two 500 kw. generators, two 200 hp. boilers and auxiliary machinery. W. A. Fuller, 1971 Railway Exchange Building, St. Louis, is engineer.

The County Commissioners, City Hall, Minneapolis, Minn., are having plans completed for a new power house at Glen Lake, to cost about \$200,000, with machinery Sund & Dunham, 514 Essex Building, Minneapolis, are architects.

Fire, Oct. 17, destroyed the three-story works of the Knudsen Auto Co., 202 Superior Street, Duluth, Minn., including machinery and tools, with loss approximately \$75,000. H. B. Knudsen is head.

The City Council, Fairmont, Minn., has tentative plans under way for the installation of a municipal water softening plant, for which a fund of about \$60,000 will be arranged. Jones & Curtis, Fairmont, are engineers.

The Minneapolis Steel & Machinery Co., Minneapolis, Minn., has plans in progress for enlargements, to include several shops primarily for locomotive repair work. Additional equipment will be installed.

The Eagle Ottawa Leather Co., Grand Haven, Mich., will install additional power equipment at its plant, including mechanical stokers, pumps, feed-water regulators and other apparatus. Cahill & Douglas, 217 West Water Street, Milwaukee, are engineers.

The Rockford Malleable Iron Works, Rockford, Ill., has foundations in progress for a one-story annealing plant, 90 x 120 ft., to cost about \$40,000. George C. Forbes is secretary and treasurer.

Cleveland

CLEVELAND, Oct. 30.

LOCAL manufacturing houses are getting a fair volume of scattered orders, almost entirely for single machines. Some automobile manufacturers are buying small lots or single machines for replacement purposes, and there is a moderate volume of buying by automobile parts manufacturers, whose orders are generally for small machines. The most important prospect in the automotive industry is the Kelsey Wheel Co., Detroit, which is reported to be in the market for equipment for manufacturing motors for the Gray car. Screw machine manufacturers are booking numerous small orders. During the week the Republic Brass Co., Cleveland, purchased five screw machines from a local manufacturer.

Railroad business is dragging and no sales are reported from that source. The volume of inquiries seems to have improved, and a few inquiries for large machines are pending. Machine tools business as a whole during October was in the same volume as in September.

The only price change reported is a 10 per cent advance by the Porter-Cable Co. on its line of tool room lathes, effective Nov. 1.

The Lampson & Sessions Co., Cleveland bolt, nut and rivet manufacturer, will enlarge its Kent plant by the erection of a single story building, providing 35,000 sq. ft. of floor space. This is the former plant of the Falls Rivet Co., which was acquired by the Lampson & Sessions Co. last June. Some bolt making and other machinery will probably be required, but the company advises that it will make no purchases before spring.

The Denby Wire & Iron Co., 5119 Euclid Avenue, Cleveland, will erect a one-story manufacturing plant, 40 x 105 ft., at 3005 East Eighty-first Street. It manufactures wire railings, bank fixtures, grills, etc.

It is reported from Lima, Ohio, that the Chamber of Commerce of that city has closed negotiations with the Pittsburgh Engineering Co., Jeannette, Pa., to remove its plant to Lima.

The Stull-Boylston Co. will erect a three-story factory in Lima, Ohio, for the manufacture of pencils and pens. The plant now located at Addelboro, Mass., will be moved to Lima as soon as the new building is completed; and the

executive offices now located at Fremont, Ohio, will also be moved to Lima.

It is announced that the Herbrandt Co., Fremont, Ohio, will erect a branch plant for the manufacture of wrenches.

The American Steel Foundry, Alliance, Ohio, is inquiring for a 4000 lb. steam forging hammer. A double stand hammer with extra heavy anvil for heavy duty is specified.

The General Tire and Rubber Co., Akron, Ohio, will enlarge its plant by the erection of three three-story buildings, 60 x 100 ft., 40 x 180 ft., and 36 x 100 ft., respectively.

The Sunray Stove Co., Delaware, Ohio, will enlarge its plant by the erection of a brick factory, 60 x 100 ft.

Milwaukee

MILWAUKEE, Oct. 30.

OCTOBER sales of machine tools are reported by most builders in this market as exceeding the volume in any month this year, although a few shops, such as milling machine makers, find that April and May still stand out as high lights in this year's sales to the automotive industries. Railroad business continues to make gains. Although nothing definite has been made public, it is reported that the Chicago, Milwaukee & St. Paul intends to make some fair-sized purchases for the West Milwaukee locomotive and car repair shops. This business probably will be placed through the general offices in Chicago. The Federal Rubber Co., Cudahy, Wis., is buying a miscellaneous list of tools, and already has bought a Niles-Bement-Pond boring mill and several other items. The Allis-Chalmers Mfg. Co. is buying some new equipment from time to time, but no large list is in immediate prospect. The Seaman Body Corporation is buying wood and metal-working machinery for a \$350,000 factory extension.

The S. Miller Cold Storage Co., Rhinelander, Wis., is inquiring for power plant and refrigerating equipment for a three-story warehouse, 44 x 116 ft., the general contract for the erection of which was let Oct. 25 to Krasin Brothers, architects and builders, 151 South Central Avenue, Marshfield, Wis. The investment will be about \$75,000 in all.

The Chippewa Valley Auto Co., Chippewa Falls, Wis., has placed the general contract with Tschopp, Durch & Canastral, local contractors, for a \$75,000 garage, sales and service building at West Grand Avenue and Bay Street. It will be four stories, 100 x 110 ft. The machine shop will occupy about 7500 sq. ft. Equipment is now being purchased. Fred A. Bigler is president and general manager.

The August C. Beck Co., 1-30 East Street, Milwaukee, manufacturer of shipping cases, cigar boxes, etc., has started work on the reconstruction of the main mill and factory damaged by fire early in October. New wood-working equipment and some power plant machinery are being purchased. The architect is Henry G. Lotter, 427 Milwaukee Street. Ernest E. Fair is secretary and manager of the Beck company.

The Allan-Diffenbaugh Wrench & Tool Co., Baraboo, Wis., has authorized an issue of \$25,000 additional stock for the purchase of a miscellaneous list of equipment for the production of wrenches, mechanics' tools, etc. The present capacity is fully occupied past Jan. 1. Lorenz Maisel is works manager.

The Madison Pattern Works, 2019 Winnebago Street, Madison, Wis., has let contracts for a one-story brick and concrete addition, 50 x 85 ft., to cost about \$17,000 with additional equipment now being purchased.

The United States Engineer Office, Federal Building, Milwaukee, is taking sealed bids until Nov. 27 for furnishing one dipper dredge complete with hull and house. No estimate of the price is given.

Heilprin & Co., Madison, Wis., wholesale fruit, vegetable and grocery dealers, have purchased a site at North Bedford and West Mifflin Streets for a new cold storage warehouse estimated to cost \$85,000. Work will begin Jan. 1, when possession of the property will be given the new owners. The warehouse at West Main Street and the Illinois Central tracks also will be rebuilt and enlarged at a cost of \$25,000 next spring.

The John Wilging Co., 1612 Teutonia Avenue, Milwaukee, will build a two-story factory, 80 x 120 ft., of brick and concrete, for the manufacture of fine millwork, interior fixtures and hardwood specialties, at Thirty-third and Burleigh Streets.

The Mayville, Wis., Board of Education has commissioned

Parkinson & Dockendorff, architects, LaCrosse, Wis., to design a new high school and manual training building, two stories, 112 x 274 ft., with separate heat and power plant; estimated cost, \$245,000 complete. Contracts will be let about Jan. 1. Alvin Draeger is secretary of the board.

Indiana

INDIANAPOLIS, Oct. 30.

THE Tokheim Oil Tank & Pump Co., Fort Wayne, Ind., manufacturer of gasoline pumping and storage systems, has completed plans for a one-story plant on Wabash Avenue, 150 x 350 ft., estimated to cost \$100,000, including machinery.

The Citizens' Heat, Light & Power Co., Winchester, Ind., will make extensions in its plant and system, including power houses at Modoc and Losantville, Ind., estimated to cost \$125,000 with equipment.

The Indestructible Wheel Co., Lebanon, Ind., manufacturer of automobile wheels, will take bids at once for a new two-story plant, 100 x 160 ft., for wire wheel production, estimated to cost \$65,000.

The United Public Service Corporation, Rochester, Ind., has acquired the power plant and system of the Logansport Utilities Co., Logansport, Ind. Extensions and improvements will be made, and additional equipment installed, to cost about \$150,000.

The Cudahy Packing Co., 111 West Monroe Street, Chicago, has plans in progress for an addition to its refrigerator car manufacturing plant at East Chicago, Ind., to cost about \$75,000. Other departments will be extended to provide for a production of 750 refrigerator cars during the next twelve months.

The Common Council, Merom, Ind., has tentative plans under way for the installation of a municipal electric plant and system.

The Valparaiso Lighting Co., Valparaiso, Ind., will acquire the plant and property of the Monterey Light & Power Co., Hebron. Extensions and improvements will be made, including the installation of additional equipment.

The Merchants' Heat & Light Co., Indianapolis, will issue bonds for \$267,000 and stock for \$87,000, a portion of the proceeds to be used for extensions.

The Standard Oil Co. of Indiana, Indianapolis, will install new power equipment at its plant at Whiting, Ind., including boilers, stokers, etc.

Cincinnati

CINCINNATI, Oct. 30.

RAILROAD business again was a big factor in the local machine tool market last week. One manufacturer reports orders amounting to approximately \$60,000, the greater part coming from the Burlington. The Rock Island also bought a number of tools. The Missouri-Kansas-Texas has made further purchases, and, in addition to a number of miscellaneous machines booked locally, is reported to have placed its lathe requirements with a St. Louis district manufacturer. The Cincinnati Hy-Speed Machine Co., drilling machine manufacturer, bought six tools, involving an expenditure of approximately \$20,000, a local dealer getting the order.

Reports generally showed a falling off in industrial purchases for the early part of the month, but the amount of railroad business placed makes the month one of the best with many manufacturers since 1920. In the last few days a number of orders for one and two machines have been booked and similar inquiries coming out have greatly encouraged the trade.

While reports are heard of low prices being quoted, these are traced to old quotations made before the general advance in prices in September, and in practically all cases quotations made on the old prices have been withdrawn and the new lists are being firmly adhered to.

The Cincinnati Galvanizing Co., Cincinnati, through the Schott Brothers Realty Co., has purchased land from the Procter & Gamble Co., at Spring Grove Avenue and Chickering Street, and is having plans prepared for a new factory. George M. Schott is president.

The main shops of the Tennessee Central Railway, Nash-

ville, Tenn., were practically destroyed by fire Oct. 27, with loss estimated at \$400,000. Five locomotives, 50 box cars and a large quantity of valuable machinery were also destroyed.

The plant of the Lexington Battery Mfg. Co., Lexington, Ky., was destroyed by fire Oct. 13, causing a loss of \$75,000. It will be rebuilt.

The Chevrolet Motor Co., Detroit, is taking bids on a plant 300 x 600 ft., to be erected in Norwood, Ohio, and a similar adjoining building will be erected by the Fisher Body Corporation. While the purpose of the new structures has not been definitely announced, it is reported that they will be used for assembling the new air-cooled car soon to be put on the market by the General Motors Corporation. Bids for the buildings will close Nov. 7. The cost, with equipment, is estimated at \$3,000,000.

A movement is on foot to consolidate the Monroe Motor Co., Indianapolis, with a Louisville, Ky., manufacturing plant, the purpose being the moving of the Monroe company's business to Louisville. Should the consolidation go through, plans provide for an output of 30 cars a day, giving employment to 400 men.

The Belden Brick Co., Somerset, Ohio, is making additions which will increase the capacity 25 per cent. Further extensions are contemplated during the winter. G. A. Brand is superintendent.

The Ohio Power Co. has appropriated \$387,000 for improvements in and around Lancaster, including the building of a new sub-station and construction of high voltage lines from Lancaster to Logan, the latter involving an expenditure of \$200,000.

The Fabricated Steel Products Co., Leetonia, Ohio, is in the market for a used cupola fan, 30 or 36 in., belt driven.

The Gulf States

BIRMINGHAM, Oct. 30.

DWIGHT P. ROBINSON & CO., INC., New York, has been awarded contract for the erection of a cement mill at Birmingham for the Lehigh Portland Cement Co., Allentown, Pa. It will have a capacity of 1,000,000 bbl. a year.

The Galveston, Harrisburg & San Antonio Railroad Co., Houston, Tex., operated by the Southern Pacific Railroad Co., has plans for a new repair plant at El Paso, Tex., including a one-story locomotive erecting shop to cost \$250,000; addition to present engine house and shop, \$50,000; storehouse and other buildings, \$50,000. J. W. Harshaw is division engineer.

The New Orleans Public Service, Inc., New Orleans, is disposing of a bond issue of \$12,000,000, a portion of the proceeds to be used for electric plant extensions and improvements. A. L. Kempster is vice-president and general manager.

The State Board of Regents, University of Texas, Austin, has plans nearing completion for a new power house at Galveston, Tex., in connection with a proposed medical college, with total estimated cost of \$400,000. The Herbert M. Green Co., North Texas Building, Dallas, Tex., is architect.

The city of Miami, Fla., Frank H. Wharton, general city manager, will take bids until Nov. 7 for centrifugal and other pumping machinery, motors and miscellaneous equipment for the municipal water plant. Charles W. Murray is director of public service.

Dowling Brothers, Odessa, Fla., are planning to rebuild their lumber mill, recently destroyed by fire with a loss of \$250,000, including power house, machine shop and other buildings.

The Terminal Oil and Refining Co., Texas City, Tex., has plans nearing completion for an addition to its local refinery and oil-topping works, to more than double the present capacity. C. E. Robertson is general superintendent.

The Common Council, Raymondville, Tex., has plans in progress for a new municipal electric light and power plant.

The Imperial Oil & Gasoline Products Co., Sterlington, La., is planning for extensions and improvements to cost \$150,000, including machinery.

The Common Council, Franklin, La., has plans in preparation for a new unit at the municipal light and power plant.

The Robbins & Fletcher Co., Eldorado, Tex., is planning for a new local ice-manufacturing and refrigerating plant. A list of machinery will be arranged.

The Gonzales Cement Works, Gonzales, Tex., has plans in progress for a new two-story plant, 50 x 90 ft., with adjoining one-story structure, 40 x 50 ft. A. O. Neumann heads the company.

The Rosedale Compress Co., Rosedale, Miss., plans to rebuild the portion of its plant recently destroyed by fire with loss estimated at close to \$40,000.

Bonds for \$25,000 have been approved at Tulia, Tex., for

extensions and improvements at the municipal electric plant.

The General American Tank Car Corporation, 111 West Monroe Street, Chicago, has acquired about 300 acres near New Orleans as a site for a new plant to manufacture and repair steel railroad cars. Plans will be prepared at once. A power house will be constructed.

The Common Council, Canton, Tex., has tentative plans under way for a municipal electric light and power plant.

The Colorado, Columbus & Mexican Railroad Co., Columbus, N. M., recently organized, will construct car and locomotive repair shops on site to be selected, in connection with the proposed new line from Columbus to Farmington, N. M., and branch road to El Paso, Tex. Application has been made to issue bonds for \$20,000,000 and stock for \$5,000,000 for the project.

William L. Papham, Apalachicola, Fla., is organizing a company to build and operate an ice-manufacturing plant, with electrically-operated refrigerating department.

The Kilby Pipe Co., Anniston, Ala., recently organized, has preliminary plans in progress for a new foundry to manufacture cast iron pipe. A department will be established for the manufacture of fittings and other castings. E. M. Kilby heads the company.

The Central South

ST. LOUIS, Oct. 30.

ALL of the list of machine tools on which prices were asked by the Missouri-Kansas-Texas Railway have been purchased. It is understood that most of the equipment went to Manning, Maxwell & Moore. Aside from this, there is more activity in the market for machine tools.

The United States Public Service Co., St. Louis, is disposing of a bond issue of \$1,100,000, a portion of the proceeds to be used for extensions and improvements in plants and system. H. Wurdack is president.

The Midwest Piping & Supply Co., 1452 South Second Street, St. Louis, is taking bids for a one-story and basement addition, 120 x 135 ft., to cost \$35,000. Klipstein & Rathman, Chemical Building, are architects.

The Springfield Ice & Refrigerating Co., Springfield, Mo., has plans in progress for an addition, with improvements in present building, to cost \$55,000. Ophuls & Hill, 112 West Forty-second Street, New York, are engineers. A. F. Johnson is general manager.

A power house will be installed at the new North Side high school on Natural Bridge Avenue, St. Louis, for which plans are being prepared, to include two 350-hp. boilers, stokers, pumping machinery, mechanical fans, etc. R. M. Milligan, 506 Board of Education Building, is architect.

Fire, Oct. 20, destroyed the planing mill at the plant of the Blackfoot Lumber Co., Stamps, Okla., with loss estimated at \$60,000, including machinery. It is planned to rebuild.

The Arkansas Light & Power Co., Arkadelphia, Ark., is planning for a new power house at Smackover, Ark., for local light and power supply, to cost \$30,000.

The Sinclair Consolidated Oil Corporation, 45 Nassau Street, New York, has extension and improvement work under way at its refinery at Coffeyville, Kan., to develop a capacity of 5000 bbl. per day. Construction is also in progress on a second unit at the refinery at East Chicago, Ind., to have a daily capacity of about 10,000 bbl. Plans are under consideration for another unit at Houston, Tex.

The Board of Commissioners, Artesian Water Department, Memphis, Tenn., will take bids until Nov. 24 for equipment for installation at a new waterworks plant, including two 100-kw. direct-connected unaflo engine-generator sets and switchboard; coal and ash-handling system; three low-head centrifugal pumps, direct-connected to reaction water turbines. A traveling crane will also be installed. Fuller & McClintock, 421 Produce Exchange Building, Kansas City, Mo., with branch office at 170 Broadway, New York, are engineers.

The New State Ice Co., Oklahoma City, Okla., has plans in progress for a new electrically-operated ice-manufacturing plant, with 6000-ton cold storage building adjoining. The present works will be remodeled and improved. Total cost is estimated at close to \$290,000, including machinery. Ophuls & Hill, 114 West Forty-second Street, New York, are engineers. Carl S. Glitsch is vice-president.

The Carthage Spoke Co., Carthage, Tenn., plans for an addition to its factory, including improvements in present works. New machinery will be installed. The capital has been increased from \$50,000 to \$100,000.

The Knoxville Power & Light Co., Knoxville, Tenn., has

arranged a fund of \$430,000, for power plant and system extensions and improvements. C. H. Harvey is president.

The Duncan Machinery Co., Knoxville, Tenn., machinery dealer, has inquiries out for a complete steam power plant, with engine, generator, etc., with capacity not less than 200 hp.; also, for a used portable truck loader, operated with a gasoline engine, in good condition.

The Louisville & Nashville Railroad Co., Louisville, is considering plans for the removal of its car construction and repair shops from Earlington, Ky., to a new site at Atkinson Junction, Ky., where the capacity will be increased. W. H. Courtenay is chief engineer.

The West St. Louis Water & Light Co., Clayton, Mo., plans for extensions and improvements in power house and system, including the installation of additional equipment to cost about \$250,000.

The Empire Refineries, Inc., Ponca City, Okla., will make further additions and improvements in its oil refinery, to cost in excess of \$1,000,000 with equipment. This is in addition to approximately \$2,000,000 which has been expended in recent months.

The Illinois Central Railroad Co., 135 East Eleventh Place, Chicago, has tentative plans under way for extensions in its shops at Paducah, Ky. Improvements will also be made in the present works. E. L. Thompson is chief engineer.

The Oklahoma Fabric & Rubber Co., recently organized with a capital of \$2,500,000, has plans in progress for new works in the vicinity of Muskogee, Okla., estimated to cost \$1,000,000, including machinery. Officials of the Allentown Tire & Rubber Co., Allentown, Pa., are identified with the new company. The Chamber of Commerce, Muskogee, is interested in the project. A. C. Leathers, general manager of the parent organization, will act in the same capacity for the new company.

G. E. Osborn, 433 Wabash Avenue, Wichita, Kan., is arranging a list of machine tools and other equipment for installation at his proposed machine shop for parts manufacture and general repairs.

The Pacific Coast

SAN FRANCISCO, Oct. 24.

PLANS are nearing completion for a one-story foundry, 36 x 75 ft., at 1901-3 Santa Fe Avenue, for the Atlas Brass Foundry Co., Los Angeles. V. P. Gilbert, 431 Citizens' National Bank Building, is architect.

The United Engine & Machine Co., Fresno, Cal., has been organized with a capital of \$250,000 to take over and merge the Fresno Pattern Works, 2137 Cherry Avenue, and the Sulprizio Machine Works, 507 Broadway. Plans are in progress for new works, to include a one-story foundry, 100 x 150 ft.; one-story machine shop, 100 x 150 ft.; one-story forge shop, 50 x 75 ft., and one-story pattern shop, 50 x 75 ft. The new company will specialize in the manufacture of piston rings, valves, general castings, etc. G. J. Dolan, Jr., and D. Sulprizio head the organization.

The Western States Gas & Electric Co., Stockton, Cal., has arranged for a note issue of \$5,000,000, a portion of the proceeds to be used for extensions and improvements.

The Southern California Edison Co., Los Angeles, has plans in progress for a machine and electrical repair shop, 170 x 270 ft., to be erected in connection with a group of warehouses, 200 x 600 ft., 100 x 400 ft. and 100 x 100 ft., at Alhambra, Cal. Material-handling machinery will be installed in the last noted. The project will cost about \$750,000.

Four electric booster plants and a main electrically operated pumping plant will be constructed by the West Stanislaus Irrigation District, Crows Landing, Cal., in connection with a new irrigation project to cost \$600,000. E. N. Bryan, Forum Building, Sacramento, Cal., is engineer.

The Imperial Ice & Development Co., Calexico, Cal., will lay foundations at once for an addition to its ice-manufacturing plant with capacity of 10,000 tons. An addition to the cold storage plant at Brawley, Cal., with capacity of 3500 tons will also be built.

The Utah Power & Light Co., Salt Lake City, Utah, will construct and operate a hydroelectric generating plant in the vicinity of Soda, on the Bear River. Plans are under way for two units, each with capacity of 10,500 hp.

The Ventura Associated Oil Co., Los Angeles, has tentative plans under consideration for a new oil refinery in the vicinity of Wilmington, Los Angeles Harbor. A storage and distributing plant will also be built.

The Municipal Power Department, Los Angeles, has arranged for a bond issue of \$1,149,000, known as the Los Angeles City Electric Plant, a portion of the proceeds to be used for extensions and improvements. E. F. Scattergood is chief engineer.

The Washington Automobile Body & Wheel Co., 911 Eleventh Avenue, Seattle, has preliminary plans under way for a one-story addition. Lewis Williams heads the company.

The City Council, Logan, Utah, has made application for permission to construct and operate a municipal hydroelectric power plant on the Logan River, near the State Dam. The initial capacity will approximate 1000 hp.

The Washington Iron Works, Seattle, is completing plans for a new one-story foundry, 130 x 660 ft., at 1500 Sixth Avenue, estimated to cost \$100,000. Several electric traveling cranes will be installed. Richard Ellis is company engineer in charge.

The Beaver Portland Cement Co., Portland, Ore., is said to have preliminary plans under way for a new plant in the vicinity of Grants Pass, Ore., estimated to cost \$600,000. Plans are also in progress for the development of cement rock deposits in Josephine County, to include the construction of a 3-mile railroad and tramway system. The latter work will cost about \$500,000.

Canada

TORONTO, Oct. 30.

IMPROVEMENT in industrial activities is being reflected in a stronger demand for machinery and general plant equipment. Additional announcements regarding new construction are also having their effect on the machinery market and inquiries are being sent out more freely than at any time this year. Demand includes practically all lines, but is more pronounced in woodworking equipment.

The automotive industry is not buying as freely as a month or two ago, but inquiries are out for equipment for two or three plants now under construction. The call on replacement account continues to hold and good business is being done in one or two machines to various buyers. Small tools are still moving freely and orders are said to be of a larger volume than a month or so ago.

J. Read, care the Bridge River Power Co., 602 Hastings Street West, Vancouver, B. C., is interested in prices of equipment for a pulp and paper mill.

The Brantford Arena Co., Brantford, Ont., will erect a plant and is interested in ice making machinery.

The Humberstone Shoe Co., Ltd., Humberstone, Ont., is in the market for two 4-in. gearless sole cutting machines; one 5-hp. electric motor; one clicking machine and other equipment. H. H. Knoll is purchasing agent.

The Moffat Stove Co., Ltd., Denison Avenue, Weston, Ont., will build a two-story addition, 60 x 100 ft., to cost \$60,000, and will shortly be in the market for equipment for a porcelain enameling department. F. W. Moffat is interested.

The Parlor Furniture Mfg. Co., Victoria Street, Pointe aux Trembles, Que., whose plant was recently destroyed by fire, will rebuild without delay and is interested in woodworking equipment. G. Langeller is interested.

The Cameron Motor Co., Cleveland, Ont., is contemplating the erection of a plant at Niagara Falls, Ont.

The D. W. Robert Mfg. Co., Lockport, N. Y., is asking bids for a one-story factory, 40 x 80 ft., to be erected at Niagara Falls, Ont., for the manufacture of knives, etc., for paper cutting.

The Fisher Motor Co., Ltd., Orillia, Ont., has completed its new plant and operations have commenced. It is three stories, 75 x 200 ft., and is equipped for the manufacture of die castings, sheet metal stampings, fountain equipment, ball arm radiator caps, etc.

The London Shipping Containers, Ltd., London, Ont., will erect a factory for the manufacture of cartons.

The Dominion Steel Corporation, Sydney, N. S., will install additional equipment in its wire mill with the intention of doubling the present capacity. The installation will include a galvanizing frame which will enable the company to turn out 120 tons of fence material per day, instead of 60 tons as at present. Work will start immediately and the plant is expected to be in operation by February.

Leston & Burnell, 172 Alexander Street, Vancouver, B. C., will rebuild factory and machine shop at a cost of \$40,000, recently destroyed by fire, and are interested in prices and information regarding equipment.

The Northern Aluminum Co., 158 Sterling Road, Toronto, is proceeding with the erection of a plate mill to cost \$200,000.

Current Metal Prices

On Small Lots, Delivered from Merchants' Stocks, New York City

The following quotations are made by New York City warehouses.

As there are many consumers whose requirements are not sufficiently heavy to warrant their placing orders with manufacturers for shipments in carload lots from mills, these prices are given for their convenience.

On a number of articles the base price only is given, it being impossible to name every size.

The wholesale prices at which large lots are sold by manufacturers for direct shipment from mills are given in the market reports appearing in a preceding part of THE IRON AGE under the general heading of "Iron and Steel Markets" and "Non-ferrous Metals."

Iron and Soft Steel Bars and Shapes

Bars:	
Refined iron bars, base price.....	3.04c.
Swedish bars, base price.....	7.50c.
Soft steel bars, base price.....	3.04c.
Hoops, base price.....	4.39c.
Bands, base price.....	3.84c.
Beams and channels, angles and tees	
3 in. x ¼ in. and larger, base.....	3.14c.
Channels, angles and tees under 3 in.	
x ¼ in., base.....	3.04c.

Merchant Steel

	Per Lb.
Tire, 1½ x ½ in. and larger.....	3.10c.
(Smooth finish, 1 to 2½ x ¼ in. and larger) ..	3.30c.
Toe-calk, ½ x ¾ in. and larger.....	4.15c.
Cold-rolled strip, soft and quarter hard..	6.75c. to 7.25c.
Open-hearth spring steel.....	4.50c. to 7.00c.
Shafting and Screw Stock:	
Rounds.....	3.90c.
Squares, flats and hex.....	4.40c.
Standard cast steel, base price.....	15.00c.
Extra cast steel.....	18.00c.
Special cast steel.....	23.00c.

Tank Plates—Steel

¾ in. and heavier.....	3.14c.
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Sheets

Blue Annealed

	Per Lb.
No. 10.....	4.19c.
No. 12.....	4.24c.
No. 14.....	4.29c.
No. 16.....	4.39c.

Box Annealed—Black

	Soft Steel C. R., One Pass, Per Lb.	Blued Stove Pipe Sheet, Per Lb.
Nos. 18 to 20.....	4.30c. to 4.70c.	5.00c.
Nos. 22 and 24.....	4.35c. to 4.75c.	5.00c.
No. 26.....	4.40c. to 4.80c.	5.05c.
No. 28.....	4.50c. to 4.90c.	5.15c.
No. 30.....	4.75c. to 5.15c.
No. 28 and lighter, 36 in. wide, 10c. higher.		

Galvanized

	Per Lb.
No. 14.....	4.60c. to 5.00c.
No. 16.....	4.75c. to 5.15c.
Nos. 18 and 20.....	4.90c. to 5.30c.
Nos. 22 and 24.....	5.05c. to 5.45c.
No. 26.....	5.20c. to 5.60c.
No. 27.....	5.35c. to 5.75c.
No. 28.....	5.50c. to 5.90c.
No. 30.....	6.00c. to 6.40c.
No. 28 and lighter, 36 in. wide, 20c. higher.	

Welded Pipe

Standard Steel

	Black	Galv.
½ in. Butt... —50	—42	
¾ in. Butt... —55	—44	
1-3 in. Butt... —57	—44	
2½-6 in. Lap... —54	—41	
7-8 in. Lap... —50	—26	
9-12 in. Lap... —46	—25	

Wrought Iron

	Black	Galv.
½ in. Butt... —11	+13	
¾ in. Butt... —17	—1	
1-1½ in. Butt... —20	—2	
2 in. Lap... —14	+2	
2½-6 in. Lap... —18	—2	
7-12 in. Lap... —10	+6	

Steel Wire

	Per Lb.
Bright basic.....	4.50c. to 4.75c.
Annealed soft.....	4.50c. to 4.75c.
Galvanized annealed.....	5.15c. to 5.40c.
Coppered basic.....	5.15c. to 5.40c.
Tinned soft Bessemer.....	6.15c. to 6.40c.

*Regular extras for lighter gage.

Brass Sheet, Rod, Tube and Wire

BASE PRICE

High brass sheet.....	19¼c. to 20¼c.
High brass wire.....	20¼c. to 20¼c.
Brass rod.....	16¼c. to 17¼c.
Brass tube, brazed.....	26¼c. to 27¼c.
Brass tube, seamless.....	23 c. to 23¼c.
Copper tube, seamless.....	25¼c. to 26 c.

Copper Sheets

Sheet copper, hot rolled, 24 oz., 22¼c. to 23¼c. per lb. base.
Cold rolled, 14 oz. and heavier, 3c. per lb. advance over hot rolled.

Tin Plates

Bright Tin	Grade "AAA" Charcoal 14x20	Grade "A" Charcoal 14x20	Coke—14-20	Primes	Wasters
IC..	\$10.00	\$8.50	80 lb..	\$6.05	\$5.80
IX..	11.50	10.00	90 lb..	6.15	5.90
IXX..	13.00	11.25	100 lb..	6.25	6.00
IXXX..	14.25	12.50	IC..	6.40	6.15
IXXXX..	16.00	14.00	IX..	7.40	7.15
			IXX..	8.40	8.15
			XXX..	9.40	9.15
			IXXXX..	10.40	10.15

Terne Plates

8-lb. coating, 14 x 20	
100 lb.	\$7.00
IC	7.25
IX	7.50
Fire door stock	9.00

Tin

Straits pig	39c.
Bar	45c. to 50c.

Copper

Lake ingot	15¼c.
Electrolytic	15 c.
Casting	14¼c.

Spelter and Sheet Zinc

Western spelter	8¼c.
Sheet zinc, No. 9 base, casks	10c. open 10¼c.

Lead and Solder*

American pig lead	7¼c. to 8¼c.
Bar lead	9c. to 10c.
Solder, ½ and ½ guaranteed	26¼c.
No. 1 solder	25c.
Refined solder	22¼c.

*Prices of solder indicated by private brand vary according to composition.

Babbitt Metal

Best grade, per lb.....	75c.
Commercial grade, per lb.....	35c.
Grade D, per lb.....	25c.

Antimony

Asiatie	8¼c. to 9c.
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Aluminum

No. 1 aluminum (guaranteed over 99 per cent pure), in ingots for remelting, per lb.....	25c. to 27c.
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Old Metals

Business is quiet with the exception of white metals, which are active. Dealers' buying prices are as follows:

	Cents Per Lb.
Copper, heavy crucible	12.00
Copper, heavy wire	11.50
Copper, light and bottoms.....	9.50
Brass, heavy	6.50
Brass, light	5.50
Heavy machine composition	8.50
No. 1 yellow brass turnings	6.50
No. 1 red brass or composition turnings.....	8.00
Lead, heavy	5.00
Lead, tea	4.00
Zinc	3.75

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 to 9c.
 to 27c.
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